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ABSTRACT

This final report focuses on the methodology and results of a feasibility study for the development of a statewide career information delivery system (CIDS) in Illinois. The study was conducted in four phases. Target Group Needs Analysis activities included more than a hundred interviews with representatives from prospective user groups, three public workshops, and questionnaire completion by workshop participants and other agency and organization administrators. System Criteria Development began with a review of published standards for systems and reports from other states. This literature review led to a preliminary set of system criteria, which was refined and organized on a criteria tree, and weighted; the aggregated ratings were then applied to each vendor system. Vendor System Analysis, the third phase of the study, involved compiling a vendor directory and preparing a matrix to compare the features of various computer networks. Feasibility staff recommended three systems to the advisory committee: DISCOVER, CIS, CHOICES. The last phase of the study was the development of an Implementation Plan which presented recommendations regarding CIDS organization/administration structure, financing, staffing, information development, user services, and marketing. (Author/KC)

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Career Information Delivery System Feasibility Study for the State of Illinois

Final Report

Conducted at:

Northwestern University
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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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by:

Gustave J. Rath, Ph.D.
Principal Investigator

Marilyn D. Jacobson, Ph.D.
Project Director

Barbara T. Grabowski, M.S.
Project Investigator

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Abstract

The need for timely, accurate and locally relevant career information has been escalating as new technologies, changing demographics and other societal forces impact on the economy. In the last fifteen years, computer-based guidance and information systems have been developed which make occupational descriptions, labor market information, education, training and financial aid information accessible to students, out-of-school youth and adults. This final report focuses on the methodology and results of a feasibility study for the development of a statewide career information delivery system. The study was conducted in four phases. Target Group Needs Analysis activities included over a hundred interviews with representatives from prospective user groups, three public workshops, one each in northern, central and southern Illinois, and questionnaire completion by workshop participants and other interested agency and organization administrators. The nominal group technique (NGT) was used in small group sessions during the workshops to identify and prioritize user needs. System Criteria Development began with a review of published standards for systems developed by the Association of Computer-based Systems for Career Information (ACSCI), the National Occupational Information Coordinating Committee (NOICC) and the U. S. Department of Labor. Reports from other states which had conducted feasibility studies were also consulted. The literature review led to a preliminary set of system criteria which was refined as data from interviews, questionnaires and the NGT was added. Since the criteria set encompassed a broad spectrum of considerations, a criteria tree was prepared which organized and displayed the elements for decision-making. The relative importance of the criteria was determined by the Career Information Policy Advisory Committee (CIPAC). The members of the committee assigned weights to each criterion. The aggregated rankings were then applied to each vendor system. Vendor System Analysis, the third phase of the study, involved compiling a vendor directory and preparing a matrix to compare the features of each system. The following systems were considered: AEL, CHOICES, CIS, COIN, CVIS, DISCOVER, ECES, EXPLORE, GIS, SCAD, SEARCH, SIGI, VIEW, VIP, VOCOMP. During this phase various computer networks were considered, as were issues relating to hardware/software compatibility. Illinois computer resources were also identified and correlated to vendor features. Feasibility Staff recommended three systems to the advisory committee: DISCOVER, CIS, CHOICES. The last phase of the study was the development of an Implementation Plan which presented recommendations regarding CIDS organization/administration structure, financing, staffing, information development, user services and marketing.

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Gustave J. Rath, Ph.D.
Marilyn D. Jacobson, Ph.D.
Barbara T. Grabowski, M.S.

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1.0 Executive Summary

1.1 Introduction

The need for timely, accurate and locally relevant career information has been escalating as new technologies, changing demographics and other societal forces impact on the economy. Heightened awareness of the importance of rational career decision-making is the result of the increasingly expressed desire of young and old alike to derive satisfaction as well as salary from work, the accelerating pace of job/career changing, and the assertion by special groups (women, minorities, handicapped) of their right to work at interesting, challenging and equitably remunerative jobs. Moreover, legislation mandating the "screening in" of the disadvantaged places a heavy burden on counselors to facilitate the passage from unemployment or secondary labor market jobs to continuous work that enables self-sufficiency.

Economic dislocations and labor market imbalances have spurred federal and state initiatives to insure the collection, accessibility and quality of relevant information. Legislation has mandated that the departments of education and labor coalesce on issues related to the dissemination of occupational information.

As a consequence, computerized occupational/career information and guidance delivery systems have been encouraged by federal grants to states. The first round of federal grants in 1970 was awarded to eight states following a model provided by Oregon which was funded one year earlier. Subsequently, additional grants were awarded to fifteen states. Several states have undertaken at their own initiative statewide computer-based career information systems. Prior to implementing a system in Illinois, the Department of Commerce and Community Affairs awarded a grant to Northwestern University to conduct a feasibility study.

The objective was to investigate the feasibility of implementing a statewide career information system in Illinois, to make recommendations concerning the selection of a system to CIPAC (the Career Information Policy Advisory Committee), and to prepare an implementation plan.

The study, conducted between March 15th, 1980 and September 30th, 1980 was divided into four stages:

1. Target Group Needs Analysis
2. System Criteria Development
3. Vendor Systems Analysis
4. Implementation Plan

The target group needs analysis was undertaken to determine the career information and guidance needs of prospective users of a computer-based career information delivery system (CIDS). Interviews were conducted with over 100 representative groups and individuals and public workshops were held in three locations in the state.

The system criteria development stage was based on the data collected as a result of the interviews and workshops plus review of the standards promulgated by NOICC (National Occupational Coordinating Committee), CIS (Career Information Systems - the Department of Labor) and ACSCI (Association of Computer Based Systems for Career Information). A criteria composite was the primary source for the development of a criteria tree which enabled comparisons and weighting of a large number of variables.

The vendor system analysis began by identifying the features of each vendor system. After the elements of the criteria tree were weighted by the CIPAC, costs, compatibility with Illinois computer resources and start-up ease and timing were considered.

The implementation plan examined the issues of management and financing that are critical to the establishment of a statewide CIDS. Questions relating to information development, user services and marketing were also considered and recommendations were made in respect to CIDS organizational structure, composition of the policy advisory board, relationship with IOICC (Illinois Occupational Information Coordinating Committee), staffing, user fees and marketing efforts.

1.2 Background

Within the last fifteen years computer-based guidance and information systems have been developed which put occupational descriptions, labor market information, plus education, training and financial aid information into formats usable by students (elementary through graduate school), out-of-school youth and adults. Evaluations of computer systems indicate high user acceptance and increased vocational maturity.

Computers do not replace human interaction; actually, the computer capacity for storage and retrieval of information regarding occupations, employment outlook projections, financial aid opportunities, apprenticeships, plus school and college curriculum descriptions, considerably expands the abilities of any one counselor or staff of counselors and information specialists to provide accurate, comprehensive data immediately. In essence, the computer frees the counselor from the tasks connected with information gathering and processing and permits him/her to focus, with students or clients, on the more affective aspects of career choice.

Some computer systems are programmed to correlate external information (i.e., occupations, educational and training opportunities) with personal data (location requirements, values, aptitude indicators and financial constraints). Some systems expand the data dissemination component to include assistance in the decision-making process. Most systems include modules which assist the user through careful sequenced steps in their selection of career and education or training.

In total the Illinois feasibility study considered the following career information systems: AEL, CHOICES, COIN, CVIS, DISCOVER, ECES, EXPLORE, GIS, PLATO, SCAD, SEARCH, SIGI, VIEW, VIP and VOCOMP (see Section 3 for descriptions).

An extensive history, legislative survey, and discussion of evaluative studies comprises the literature review. An up-to-date vendor directory describes the main features of each system and a matrix in which system capabilities are comparatively displayed is presented.

1.3 Methods, Techniques and Activities

The mandate for an Illinois CIDS as outlined by the Illinois Occupational Information Coordinating Committee (IOICC) was to provide high quality career information to students and clients who need it, especially those who would not otherwise have access to it. In addition, the CIDS was to meet the particular needs of the broadest possible spectrum of career information users.

The outcomes sought by the IOICC were a recommendation for a vendor system to serve as the statewide CIDS and supporting recommendations regarding target groups, delivery network, management structure, financing, policy advisory function and relationship to existing career and education guidance and information programs.

The complexity of the issues and alternatives involved in meeting the mandates and making the desired recommendations regarding a statewide CIDS required a structured, comprehensive analysis. An interesting result of this analysis was that it yielded not only a recommendation for an existing vendor system, but also suggested alternatives not previously considered.

1.3.1 Needs Assessment and Criteria Development

A major effort of the feasibility study was to assess the needs of a broad range of Illinois user groups, and develop a set of system criteria with inputs from the needs study and literature review, to be used in evaluating the vendor systems. An analytical evaluation model, capable of handling both the large number and broad range of criteria, was developed.

The first step in developing the system criteria was to review the literature, published standards for systems as well as feasibility studies conducted by other states. States such as California, Florida, North Carolina and Virginia have reported results of feasibility and evaluation studies. The outcome of this phase was a preliminary set of system criteria, which was refined in subsequent steps of the study.

Next, key user groups were identified. Direct users included CETA clients, job service applicants, community college and university students, secondary school students, rehabilitation services clients, offenders, public aid recipients and veterans. Intermediate users include counselors in secondary schools, vocational schools, colleges and social service agencies. A structured interview protocol was designed and used with representatives of potential user groups throughout the state. The outcomes of this phase were incorporated into the preliminary set of system criteria.

The final step of the process was to hold public workshops in strategic areas of the state, one each in northern, central and southern Illinois. Two techniques were used here. The nominal group technique (NGT) yielded ranked lists of the top five to seven criteria from each workshop. Furthermore, participants completed questionnaires to provide more specific information than the NGT allowed. Outcomes from the NGTs and the questionnaires were added to the existing criteria and a final set was constructed.

Since the criteria set encompassed a broad spectrum of considerations, an efficient method for evaluation was required. The criteria tree, based on multi-attribute utility theory (Miller, 1970) was developed. The criteria tree served as a hierarchical alternative to the weighted checklist approach. There were several advantages to the hierarchical approach (Miller, 1970). First, as a graphic display, it is visually appealing. Second, it captures the relationships among the criteria in a very compact and organized format. Third, it reduces assessment error due to cognitive limitations in comparing a large number of criteria.

The criteria was first organized into three major divisions: deliverer, system, content. Deliverer was then divided into vendors and user services; system was divided into software and media; content was divided into information development and information delivery. Each of these categories was further divided, to a maximum depth of four levels.

The final task in developing the criteria tree was to judge the relative importance of the criteria. Through the various data gathering modes, the project staff had an estimate for the relative importance of each criterion. However, to validate this estimate, and at the same time to involve the career information policy advisory committee (CIPAC) in the evaluation process, the CIPAC members were invited to make their own determination of the relative weight of each criterion, without knowing the weights previously assigned by the project staff.

Once the weights were assigned, a five-point scale was used to rate each system on each criterion and a ranked list was created. The top five choices warranted further investigation as to specific system features and capabilities, cost-benefit analyses, hardware/software compatibility and ability to run on the existing computer networks in Illinois, which had been inventoried concurrently with the activities outlined above. These choices were then narrowed to three vendor systems.

The two sets of criteria weights (CIPAC and Feasibility Staff) were remarkably similar, differing only in a few places. This agreement reflects staff responsiveness to CIPAC concerns, an established pattern of commitment and involvement by CIPAC members in the study and continual communication of project findings to CIPAC members.

1.3.2 Vendor Information

This step involved the compilation of a vendor list. Vendors were contacted by mail and by telephone; interviews and site visits were arranged. The project staff were able to see the systems in operation. Cost and hardware information was also obtained, and the effort resulted in the creation of a comprehensive vendor directory containing the essential information on the systems. Valuable data was also gathered through solicitation from vendors of preliminary, non-binding implementation plans for a state-wide system in Illinois. One outcome of this stage was the emergence of alternative delivery systems not previously considered, such as a future tailor-made microcomputer model and a computer-assisted instruction/career information delivery system (CAI/CIDS) model.

A matrix of systems which illustrates the relative merits of each system was developed and verified by each vendor represented.

1.3.3 Illinois Resources

Determination of computer resources in Illinois which could be used as delivery networks for a statewide CIDS was an important aspect of the study. Three networks operating in the state were considered appropriate for CIDS delivery: OMIC (Office of Management Information and Community/Illinois Department of Administrative Services), PLATO (the computer-assisted instruction package developed at the University of Illinois) and ECN (Educational Computing Network segment of the Illinois Educational Consortium).

The top-ranked vendor systems were assessed in terms of their compatibility with the three networks. The effort and cost of conversion was considered in vendor selection.

1.3.4 Vendor Recommendations

After careful assessment of all compiled data, primarily the weightings and cost factors, three systems were recommended to CIPAC: DISCOVER, CIS and CHOICES. Subsequently CHOICES was dropped from consideration due to changes in CHOICES vendor management which made unclear the terms of system acquisition.

The specific recommendation was that DISCOVER be delivered on OMIC, the Springfield-based statewide computer network, for almost immediate establishment of an Illinois CIDS. The DISCOVER/OMIC delivery network was described as Priority 1. Priority 2 was the establishment of a second delivery network by adapting DISCOVER to PLATO, thus combining the CIDS and CAI capabilities and adding a major dissemination network.

1.3.5 Implementation Plan

Originally it was intended that an implementation plan would be developed for a particular vendor system. Since the CIPAC committee had not selected a system before conclusion of the study, a general plan was developed to accommodate the systems still under consideration. The recommendations offered in each category follow:

Administration/Management

- The Illinois CIDS be operated as a separate unit reporting to the Executive Director of IOICC.
- The policy advisory board be constituted according to NOICC guidelines, with additional representation from labor, private enterprise, libraries, social welfare agencies and user agencies.
- The information collection function be distinct from CIDS operation and be organized as a separate unit which reports to and is governed by the IOICC Director.

Staff

- An Illinois CIDS be comprised of a director, user service specialists, marketing specialists and secretarial and clerical support.

Finance

- The Illinois CIDS be self-sustaining by the third year of operation, through the collection of service fees from its user agencies and organizations.
- Two sets of fees--one for state agencies and one for non-state agencies and organizations be established.
- Fees be charged from onset of service delivery.
- Agencies and organizations unable to pay for CIDS services should seek grant funds or form consortia with the purpose of sharing the costs with other units.
- The Illinois CIDS should seek out in-kind contributions from state agencies in respect to office space and information development.

Information Development

- NOICC and ACSCI standards be the basis for information development.
- Interview and workshop (NGT) data of Feasibility Study be utilized.
- The Illinois Occupational Information Needs Study be consulted.

User Services

- User service staff be responsible for maintaining the CIDS delivery network.
- Training and ongoing staff development of user agency/organization personnel be primary task.
- Development of materials for user agencies/organizations and clients be part of training and support activities.

Marketing

- The Illinois CIDS be attentive to marketing considerations from start up.
- The CIDS marketing staff develop a marketing plan which accounts for system distribution, product definition, market definition, image and marketing strategies.

1.4 Importance of Study and Conclucsions

The primary importance of the study is the development of an analytical evaluation model, capable of handling a large number and broad range of criteria. Significant, too, is the criteria development process, which drew upon a variety of techniques and data sources. The criteria tree is a concise way to display and analyze the elements which are significant in career information decision making.

Three other distinguishing characteristics were the involvement of an advisory board in the weighting process, exploration of alternatives which emerged during the study, particularly the prospect of combining CIDS and CAI capabilities, and the use of the microcomputer, and the opportunity to develop a statewide system implementatio plan. Data collection led to the production of some useful documents; namely, the criteria tree, a chart comparing state CIDS programs and a vender matrix.

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2.0 Literature Review

2.1 Introduction

Statewide career information systems are being developed to meet the increasing need of youth and adults for relevant, reliable and up-to-date information about education and occupations. Generally, career information systems which are organized to meet those needs provide:

1. Development and maintenance of accurate, reliable, current and locally relevant occupational and educational information.
2. Management of the delivery systems to ensure that the developed information is accessible to users in usable formats and at convenient locations.
3. Continuing assistance to user agencies and institutions through training, technical assistance and supportive materials to encourage utilization of the system by individuals, educators and counselors.

Systems have been organized on a statewide level to achieve economies of scale for costly services, such as information production, maintenance, system management, as well as the expenses of computer hardware and telecommunications.

A broad definition of an information system involves the coordination of component parts for collecting, providing and using information for a specified target audience or audiences. An information system is a set of procedures for gathering and analyzing data, and for synthesizing it into a form useful to its consumers. It includes developing and/or coordinating effective methods for delivering the developed information to its target audiences, and implies the need for training to insure that the information is used to its best advantage.

A comprehensive information system can help mediate the difference between people's information needs and the kinds of data necessary to meet those needs.

2.2 Computer-based Information Systems

The use by career counselors of the computer in the field of guidance is a relatively recent phenomenon. The capability of the computer to be programmed to store, retrieve and manipulate data at the command of the user enhances the effectiveness of the guidance process. Approximately thirty computerized guidance informational systems have been designed and partially developed (Harris, 1971). Some of these systems involve automation of the guidance philosophy and techniques of the counselor. Other system designers have analyzed the end goals of the counseling process and have sought to design a program which would accomplish these goals by making maximum use of the computer's capabilities. Some systems deal only with educational and occupational information, while others encompass values clarification and the process of decision-making. Some systems provide direct access to the computer via a typewriter-like keyboard or cathode-ray tube terminals, while others require the use of an optically scanned questionnaire as an access mode to the computer.

The development and use of computerized career information and guidance systems began more than a decade ago with pioneering efforts in a dozen locations. The force behind this movement was the recognition of an urgent need for an accurate and comprehensive system of information transmission to support effective career guidance practice. The selection of a computer-based system with which to store, organize, update and retrieve large quantities of information for immediate and easy access seemed to be a logical development (Harris, 1972). Walz (1970) has indicated that an emerging guidance technology provides opportunities to realize in new ways the old goals we strive for and to accomplish goals we previously thought unattainable. The development and use of computerized systems has remained in a constant state of revision and change in an attempt to accomplish the goal of an accurate and comprehensive support system.

All systems, including some no longer in use, can be divided into three general categories or types: computer-assisted or batch-process systems, online career information systems, and online career guidance systems (Morgan, 1978).

The batch-process systems normally consist of a large central processing unit (the computer) in one location that stores data files of occupational characteristics, and descriptions of colleges and universities. The user of the system completes a questionnaire or form on which one indicates the characteristics desired in an occupation or a college. Some systems use a person's ability and interest test scores. These forms or test results are sent to the computer site where the user-provided information is "fed" into the computer through data cards or an optical scanning device. The user later receives a printout from the computer which states the occupation or occupational patterns that match his characteristics, and similarly lists relevant colleges, or other such training and education information. Although the student or client is not in direct communication with the computer, and feedback is delayed sometimes up to two or three weeks, this type of system assists individuals in the decision making process by using a computer to search large data files and identify options.

With the advent of computer terminals and their communication with the computer mainframe by phone lines or cables, online career information systems emerged. In these systems, large data files are stored in the computer with the user given instant access to them through terminals. Interactive conversation or dialogue was developed in order to provide immediate communication between the computer with stored files and the user.

With online career information systems, users are not only provided the capability of fast retrieval of large data files, but they also can make sophisticated file searches; this allows them to control the addition and deletions of personal and occupational characteristics. Users are provided the opportunity to explore options broadly, recycle through search strategies using different characteristics, and consider different options based on different characteristics. An important attribute of this type of system is that the user is in direct communication with the computer and has a high level of control over its functions.

The third category or type of system, online career guidance, harnesses the computer to assist individuals in better understanding the elements of career decision making. In addition to providing the functions of the previously described online information type, these systems add components which traditionally have been part of one-to-one or group counseling; for instance, clarification of values. They attempt to present a systematic approach to the career decision making process. Such systems have given emphasis to the teaching of a decision making process which hopefully can be used again in subsequent career transitions.

Most of these career information systems contain national and/or local occupational descriptions which address most of the following categories of information: aptitudes, physical demand, working conditions, places of employment, education/training requirements, employment numbers, earnings, and occupational outlook. Different systems also include one or more supplemental files, such as information on programs of education and training, specific schools, apprenticeship opportunities, financial aid, military occupations, employers' names, additional support services, and job search skills.

2.2.1 Definition of Terms

An information system is a set of hardware, software, and informational facilities that permits the accumulation, classification, storage, and retrieval of large amounts of information. (The terms hardware and software are described below.)

An information system consists of three major components:

1. A large repository for data, called a data base or data file,
2. A means of accessing data,
3. A means of processing the data for analysis and reports.

A data base is a collection of physical data that are related to each other in a prescribed manner.

Data can be accessed from sequential or direct-access devices (also called random-access) where it is stored. A sequential access involves a magnetic tape. Direct access, which provides for almost immediate retrieval, involves disks and drums.

Processing occurs in the central processing unit, CPU. The processed data or results can be retrieved by a user at an input/output interface, or stored again on a tape or disk.

A computer system is separated into software and hardware . Hardware describes the physical computer equipment, some of which have been mentioned above. Software is the set of programs which govern the operation of a computer system and make the hardware run. In addition, it may refer to other programs specially developed to fit the user's needs.

The earlier information systems were operating as a batch-process. This is a technique in which a number of similar data or transactions are collected over a period of time and aggregated (batched) for sequential processing as a group during a machine run. Users do not have direct contact with the computer. Batch-made information systems, due to their nature, do not allow rapid information retrieval. Batch processing usually involves punched cards for input.

Online processing systems enable users direct access to the computer system via terminal devices. Information and instructions are entered via a terminal, processing is begun virtually immediately, and a response is received as soon as possible. The process usually requires direct-access storage, such as discs.

A real-time processing system is similar; it pertains to applications in which response to inputs is fast enough to guide a process or to affect subsequent inputs. Not all online is real-time, however. An online system may be shared by many users so that response time is not always immediate.

Similarly, a timesharing system involves a method of operation in which the resources of a computer facility are shared by several users via terminals at the same time. Although the computer actually services each user in sequence, the high speed of the machine makes it appear that the users are all handled simultaneously.

Computers can presently communicate with each other and supply access to large amounts of data. A collection of computers and terminals connected together by a communications system is called a computer network. Networks can be classified in a number of ways depending on the configuration, composition, topology and type of processing. A common configuration for information systems is the distributed system, which is a set of independent but interacting data bases located at different geographical points. The function of a distributed system is to process some user jobs at the points of user activity, while permitting other jobs to be transmitted to a centralized facility. For example, a number of user terminals may be connected to a mini-computer (a small general purpose computer), and a number of these mini-computers may be linked to a large-scale computer in a centralized network. This system would allow localized data storage and processing along with centralized processing.

Computer-to-terminal and computer-to-computer communications require the use of data communications lines for the transfer of messages and data. These are usually ordinary phone lines, but also include private (or leased) lines for high-volume traffic.

The software of a specific information system consists of an application package. This is a set of programs that enables the computer to perform the specific job it is required to do for that particular task, such as interactive career information retrieval. The package can be contained in a disk, which is periodically updated at a central location and shipped by mail to processing locations.

2.2.2 Overview of Computer Information Systems

The value of information is in its usefulness to those for whom it is intended. The delivery system is the method by which the user (client) gains access to the system's information. The process of accessing information may be indirect; it may be made accessible to the client through a counselor. Or the delivery system may facilitate direct interaction between the user and the information, as through user-accessible computer terminals, microfilm or needlesort delivery systems.

In general, career information systems:

- Bring order to the process of information searching (i.e., it is easy to use, comprehensive, has a theoretical base to its organization and responds consistently and predictably)
- Back its information with the assurance of quality (i.e., information is collected, analyzed and synthesized by those who have expertise in related fields)
- Permit economies of scale (i.e., lower unit costs per user are achieved by systematic development and delivery of information).

A major advantage of an information system is that it accounts for the fact that not all of its information topics will be needed by all clients. Hence, it allows users to access the particular information they want without dallying through that which they do not want. The computer's ability to instantly access and present a single information item from a bank of a thousand items is one reason for its effectiveness as an information system delivery device.

2.3 History of Career Information Systems

Within the last fifteen years computer-based guidance information systems have been developed which enable usage by vast numbers of youths and adults. While most counselors and computer guidance specialists agree that computer programs cannot replace human interaction, evaluations of computer systems indicate high user acceptance and increased vocational maturity.

Computer systems have the capacity for storage and retrieval far beyond the capability of one counselor or a full staff of counselors. In addition, the computer can correlate external information (i.e., occupations, educational and training opportunities) with individual data (location requirements, aptitude indicators and financial limitations).

In 1970 the Department of Labor awarded grants to eight states to provide for the development of occupational information services to students and out-of-school youth. The Oregon Career Information System funded the previous year served as the model for the developing programs. The programs' objectives were stated as follows:

1. To help students and others learn about and understand the range of career opportunities presently available and likely to be available in the future.
2. To help entrants into the labor force become aware of occupations which they would find acceptable and personally satisfying.
3. To encourage persons in the process of career exploration and decision making to seek out vocational information on their own.
4. To increase awareness of major sources of occupational information for acquiring knowledge of occupations and training.
5. To provide support for related programs, including career education and employment counseling, and manpower and educational planning. (U.S. DOL, 1978)

Grantee states were: Alabama, Colorado, Massachusetts, Michigan, Minnesota, Ohio, Washington and Wisconsin. Information content of each system included: occupational files, educational files, training program files, financial aid and assistance files, and bibliographic files.

The evolution of programs involving computer-based information and guidance is reflected in the nomenclature related to the system. Initially, the nine DOL grantees called their programs occupational information systems (OIS). Subsequently, the designation was altered to career information system (CIS) emphasizing the life-long, decision-making component of the system and highlighting a process which correlates goals and opportunities. The connotation attached to "occupation" had been a process limited to matching people and jobs. The latest funded programs under NOICC are referred to as Career Information Delivery Systems (CIDS), pointing up the dissemination process as a strategic part of the career information equation. The current outlook has expanded to incorporate multiple delivery modes as adjunct or augmenting modes to computer-based inquiry. Needlesort, microfiche, printed material and films are viewed not only as supplementary but as integral parts of a delivery configuration. The elements are selectable as indicated by user needs or as a result of provider cost considerations.

2.3.1 The National Occupational Information Coordinating Committee (NOICC)

The creation of NOICC in 1976 was an attempt to consolidate the efforts of states - not only the original nine funded under DOL, but other states in which computer-based systems were developing with respect to career information.

NOICC was given two basic mandates:

1. To improve coordination between, and communication among, the producers and users of occupational information.
2. To develop and implement an occupational information system which "...shall include data on occupational demand and supply based on uniform definitions, standardized estimating procedures, and standardized occupational classifications."

In addition, the NOICC was charged to assist State Occupational Information Coordinating Committees (SOICCs) that were also created by these amendments.

Four federal agencies cooperated in the establishment of the NOICC. The Department of Health, Education and Welfare (DHEW) was represented by the National Center for Education Statistics (NCES) and the Office of Education (OE). The Department of Labor (DOL) is represented by the Bureau of Labor Statistics (BLS) and the Employment and Training Administration (ETA). The operating heads of these four agencies are the actual statutory members of the NOICC. Designees of these statutory members form a Technical Steering Group (TSG) responsible for providing policy direction to the NOICC and approving fund allocations. An Interagency Agreement, signed by each of the statutory members, establishes how the NOICC shall operate.

The SOICCs are the State counterparts of the NOICC and, as such, are also required to have an Interagency Agreement among their members. The State agencies included in the SOICC by law are: (1) the State board administering vocational education, (2) the State Employment Security Agency, (3) the State Employment and Training Council (formerly the State Manpower Services Council), and (4) the State agency administering the vocational rehabilitation program. Each SOICC may invite additional agencies to participate in its program at the discretion of the signatory members. The principal source of funds provided to SOICCs by the NOICC is the SOICC Assistance Grant composed of two parts: Part A, leadership funds; Part B, SOICC discretionary funds. The leadership funds, of up to $70,000 per SOICC, are provided for basic SOICC staff and necessary overhead items. The discretionary funds are to be used for development, implementation and training activities related to the NOICC/SOICC mandates.

During fiscal year 1978 and the first half of fiscal year 1979, NOICC staff and resources were directed toward the establishment of the SOICCs and the development of guidance for the SOICCs with regard to standards for the occupational information system. (NOICC, 1979)

2.3.2 PLATO

PLATO was the first computer-based education system (CBE) to provide a high level language specific to educational applications, a powerful editor, graphics, and computational abilities. Furthermore, it utilized its networking potential by providing a policy of open access to instructional materials developed on the system; online, "live" consulting with authors needing assistance; an online manual, "Aids", which provides current information and practice for TUTOR commands; system-supported student management, data collection, and analysis routines; and a variety of communication options, including conferencing between two or more users, personal notes, student and lesson notes, and group note files. These communication services expanded, and users moved from the assumption of a "classroom of terminals running a single lesson" to the "one student, one terminal" concept. Consequently, the number of terminals that could be supported by the system dropped from the original estimates of 4,000 terminals to 1,200 terminals managed by a central system twice the original projected size. Other large and medium-size CBE systems also employed some means of limited networking in order to make their resources available to several users.

Actually, the history of computer-assisted instruction goes back to the early 1950's (Rath, Anderson and Brainard, 1959). It was during the '50's that Dr. Donald Bitzer, University of Illinois, at CERL, Computer Based Education Research Laboratory, developed the interactive computer-based system called PLATO. The current PLATO IV System presently supports 1100 terminals controlled by Central Computer System in Urbana, Illinois. While the first application of PLATO has been educational, utilizing computer CRT or hard copy terminals for individualized instruction, a recent DOL grant, has some University of Illinois staff working with PLATO to develop programs related to job search and career guidance. The prospect of extending the computer capabilities to incorporate guidance, information and instruction is now being explored.

2.4 Major Contributing Legislation

Educational and social agency personnel from all geographic areas have long been concerned with their students' and clients' lack of career development and decision-making skills. Innovative career information materials and programs have been developed in increasing numbers by school districts and other guidance facilities. Many of the new programs have been initiated or expanded through funding provided by the Department of Education, formerly U.S.O.E., office of Career Education. The Commissioner's National Conference on Career Education in 1966, presented the computer-based guidance systems which were widely accepted by professionals in the counseling and guidance areas (National Institute of Education, 1976). The need for improved methods of information processing which would provide updated and relevant information in a format attractive to students was also reviewed in the conference. The response to such a need led to the development of several other computer-based guidance systems.

At the national level, awareness of the need for improved career guidance and occupational information systems has been growing in recent years. The economic dislocations and labor market imbalances of the 1970's particularly have pointed to the need for improved career planning by individuals, as well as by education and training institutions.

The Educational Amendments of 1968 emphasized vocational guidance and provided funding to schools for fully functioning career guidance programs, including career information services, testing and test interpretation.

The emphasis, beginning in the early 1970's on career education and guidance in elementary and secondary schools,set into motion four distinct models for career education and guidance in elementary and secondary schools: school-based, employer-based, community-based, and family-based programs. These early models had, and are continuing to have, substantial influence on contemporary educational thinking in the area of experiential learning. The Career Educational Demonstration Act of 1974 established the Office of Career Education and distributed nearly fifty million dollars to promising career education activities. The Career Education Incentives Act of 1977 distributes over twenty million dollars each year into career education demonstration projects. A portion of this financial support for career education has and will continue to flow directly and indirectly into effective delivery systems of career guidance and information.

The passage in 1973 of The Comprehensive Employment and Training Act (CETA) provided for more local control of manpower training programs and funding for public service employment and training. These units of local and state government, called CETA prime sponsors, contracted extensively with local schools and agencies for improved career services models and recently, have provided more direct counseling and information services for clients.

In 1975, the Employment and Training Administration (ETA), U.S. Department of Labor, established a grants program to fund eight states to set up career information systems. This directed attention to the need for better access to occupational information and computerized delivery systems, especially those systems that could be reasonably adapted to serving an entire state. Emphasis was also placed on cooperative efforts between state manpower, educational, and other agencies for the provision of local occupational information for career decision-makers. The Oregon Career Information System was used as a statewide organizational model for this program administered by DOL's Division of Career Information Services. Oregon was set up as a public consortium with an advisory board and staff with expertise in the development of occupational and educational information, user services, data processing, and management. Four states selected Oregon's delivery system: Colorado, Massachusetts, Minnesota and Washington. Three states Wisconsin, Ohio, and Alabama chose to adapt the Guidance Information System (GIS) developed by TimeShare Corporation to meet their needs. Michigan designed its own system and developed computer software. Most of the states CISs have recently joined others to form the Association of Computer-Based Systems for Career Information (ACSCI), a non-profit corporation to enhance statewide information systems through the sharing of ideas, resources, and establishing of quality control.

A provision of The Education Amendments of 1976 established the Educational Information Centers Program (EIC) in order to provide educational information, guidance, counseling, and referral services to individuals in a state through centers located within a reasonable distance of all residents in a state, including those individuals residing in rural areas. In meeting this mandate, many states are studying operational delivery systems of educational information, with particular focus on computerized systems.

The passage of The Educational Amendments of 1976 also established the National Occupational Information Coordinating Committee (NOICC) for bringing together educational programs with those administered under the labor department. This action set into motion a state and national system for coordinating development and delivery of occupational information. The process involved an interagency agreement between ETA, and the Bureau of Labor Statistics, the United States Office of Education, and the National Center for Educational Statistics. The responsibilities of the NOICC and of the State Occupational Information Coordinating Committee (SOICC) involved improving the quality and utilization of data to be used for vocational education and for CETA, and implementing an Occupational Information System (OIS).

The passage of The Youth Employment and Demonstration Projects Act YEDPA of 1977 amended CETA and broadened the mandate of the NOICC to give special attention to the labor market information needs of youth, including encouragement for the expansion of empl ment counseling services and assistance with the development of computerized guidance systems. It also gave special attention to providing technical assistance for programs of computer on-line terminals and other facilities to utilize and implement occupational career outlook information. The purpose of the act is to improve the match between young people's career desires and available or anticipated labor market demand. YE clearly cast the NOICC and the SOICCs into the computerized career information and guidance system arena.

In late 1979, NOICC initiated a competitive grants program supporting additional development of statewide career information systems. Fifteen states received grants to establish statewide CIDS (Career Information Delivery Systems). Developmental steps in implementing a CIDS include: (1) establishing a functional organizational structure; (2) selecting a computerized information delivery system and alternative delivery media; (3) establishing cooperative arrangements with state data producers;

and (4) setting up a staff that includes individuals with competence in areas of occupational analysis, counseling, data processing, and management.

A new competition for 1980/1981, will enable an additional two or three states to initiate a CIDS.

The NOICC and the SOICCs increasingly will deal with many of the substantial issues related to the field of computerized career guidance and information systems. These issues include: (1) standardizing occupational classifications and topical categories for exchange of data bases between states and among systems; (2) increasing the quality of data that is presently in developed systems; (3) assessing delivery costs; (4) providing adequate technical assistance, including training materials to states establishing career information system and; (5) relating the career information system to the other components of the state occupational information system that they are charged to implement (Flanders, 1979).

2.5 Development of System Standards and Guidelines

Concern that information collection and dissemination be conducted in a uniform fashion which insures accuracy and reliability led to formulation of standards by the Department of Labor (Career Information Systems Standards for Organization and Development, 1978), the Association of Computer-Based Systems for Career Information (ACSCI) and NOICC (1979).

Recommendations from DOL to the original CIS states included procedures for the development of career information which offered general standards for the following components:

information topics
sources of occupational data
coverage of occupations
level of geographic specificity
length and detail of information
format and language level
accuracy and currency of information
provisions for feedback.

In addition, DOL detailed operating standards for accessing and dissemination under the headings:

- delivery system
- ease of use
- variety of media
- equipment
- copy of information to user
- housing and updating capabilities
- immediacy of retrieval
- accessing strategies
- types of settings
- scheduling
- costs.

Further, DOL imposed an organization structure on all CIS pertaining to the Board of Directors, staff, training, evaluation and system budgeting.

ACSCI proposed standards and self-evaluation guides for system assessment in the following areas:

- Organizational
- Information Development
- Marketing and User Services
- Delivery Systems
- Evaluation.

NOICC enlarged upon the DOL standards to ensure quality control in its CIDS grants to fifteen states. NOICC proposed guidelines which stated policies and procedures relating to the CIDS programs in respect to data sources, use of the Standard Occupational Classification (SOC), use of the Occupational Employment Statistics (OES) program and use of other data sources—(Vocational Education Data System (VEDS), Higher Education General Information Survey (HEGIS), State and National Apprenticeship System (SNAPS), Comprehensive Employment and Training Act (CETA) information, U.S. Employment Service (USES) data and Unemployment Insurance Services (UIS) data).

A recent memorandum from NOICC in draft form, dated September 9, 1980, revises the earlier standards and policies statement. More directive in tone, the new standard statement provides much more structure regarding information development and specifically assigns responsibility to the SOICC for assuring the quality of the data.

NOICC mandates the usage by the CIDS of the four-digit SOC code as the primary classification, effective in September, 1981.

2.6 Overview of Existing Statewide Systems

Oregon developed the Career Information System (CIS) in 1969, making it the first statewide career information system. Using computers, needlesort and hard copy, CIS now serves as a vendor assisting other states to adapt the Oregon system to their own particular needs and constraints.

Other states have adapted the CIS to their own State systems. Among these states are Alaska, California, Colorado, Georgia, Hawaii, Iowa, Massachusetts, Minnesota, Nebraska, Washington.

Funded through the Governor's Manpower Service Council, Alaska's State Department of Education began a one-year pilot-test of the Oregon Career Information System in the spring of 1978. The test is aimed at developing the necessary support for full State implementation and to work out delivery problems posed by the state's sheer size and small population base.

The Minnesota Occupational Information System is a DOL grantee and includes information on 300 occupations in Minnesota, plus preparation, program and school files. Based on CIS, MOIS uses needlesort and hard copy and the Minnesota Educational Computing Consortium to deliver information.

The Nebraska Career Information System is in an early developmental stage. Initially funded with Vocational Education Act (VEA) grants through the State Department of Education, NCIS has developed a state occupations file and has 150 needlesorts with hard copy in schools for a pilot-test. Eventually Nebraska plans to implement a computer system and will develop additional information files.

The Washington Occupational Information System (WOIS) is a DOL grantee based on the CIS model. It includes a state occupational description files. Information is delivered via computers, needlesort, hard copy and microfiche.

Several states have incorporated Guidance Information Systems (GIS) into their statewide career information systems. Among the early states to use GIS are Alabama, Ohio and Wisconsin. GIS was originally marketed as a timesharing service by TimeShare Corporation for schools interested in buying timesharing computer time. More recently, it has been sold as a software product available to individual schools for their own computers. GIS uses the Dictionary of Occupational Titles for occupational categories and the system contains over 1100 representative jobs cross-filed by 460 characteristics.

The Alabama Occupational Information System (AOIS) delivers information via computer terminals located in user sites and through a manual needlesort called OCCUSORT. Information files include: (1) a national occupational file; (2) a state occupational file; (3) a state occupational training file; (4) national and state two- and four-year colleges; (5) information on national and state financial aid sources; (6) career resource information; and (7) a summary of the state job bank.

A DOL grantee, the Wisconsin Occupational Information System (WOIS) has national and state occupational files, as well as national and state information on two- and four-year colleges and universities.

The Colorado Career Information System (COCIS) is located at the University of Colorado in Boulder. A Department of Labor grantee, COCIS is based on the CIS model and includes files on state occupations, preparation and program of study, information on major Colorado employers, interviews with people in various occupations, job search skills, and resources and bibliographic references. It delivers information via computer and a needlesort with hardcopy.

The Georgia Career Information System (GCIS) is in an early developmental stage. Located at Georgia State University, the system is currently being pilot-tested in selected sites while seeking funds for a full-scale implementation effort. Its initial actibity has been funded by small grants from Atlanta-area sources.

Organized as a unit of the Guidance Services Section of the Department of Public Instruction, the Career Information System of Iowa (CISI) delivers occupational and preparations information via computer terminal, needlesort, and microfiche.

Organized as a non-profit corporation, the Massachusetts Occupational Information System (MOIS) is a DOL grantee. MOIS uses computers to deliver a state occupational file, preparation information, and information on all New England colleges and universities, as well as Massachusett's proprietary schools and apprenticeship programs. MOIS has a process for identifying financial aid and scholarship programs available from both public and private sources.

The Ohio Career Information System uses computers to deliver national and state occupational information, and information about the nation's colleges, as well as Ohio vocational schools.

The Michigan Occupational Information System (MOIS) uses computers and microfiche to deliver information. MOIS maintains a state occupational file, information on programs of study and training and apprenticeship programs as well as information on Michigan postsecondary schools. MOIS incorporates the VIEW microfiche program and the Instant Career Program Directory (ICPD).

North Carolina's State Department of Administration has contracted with the State Occupational Information Coordinating Committee (SOICC) to implement a career information system. The Canadian CHOICES system has been adapted by North Carolina with the standard occupational classification (SOC) codes for field testing. Florida is also field testing CHOICES.

South Carolina is in the process of developing a state career information system based on the Coordinated Occupational Information Network (COIN) system.

The following are not statewide delivery systems but in some cases operate extensively within states, and in one or two instances, exceed the number of sites of the designated statewide system.

EUREKA, the California Information System, is in its second year of operation. Developed in the San Francisco area, EUREKA is now beginning to serve other areas of the state. Funded through a grant from the California Postsecondary Education Commission as well as other grant sources, it is based on the Oregon CIS model. Information is delivered by computer and includes the following files: (1) occupations localized to regions of the state; (2) ways to prepare for those occupations; (3) descriptions of programs of study and training offered in postsecondary institutions in California; and (4) a file of information on post-secondary institutions in the State.

The Computerized Vocational Information System (CVIS) was developed at Willowbrook High School and is currently being used in numerous secondary schools in various states. CVIS contains eight programs for students and also offers an administrative capability called "Select-a-Course" which handles registration and student records functions. The Vocational Exploration file, containing descriptions on several hundred occupations, is accessed according to questionnaires based on Roe's classification system at the senior high school level. Student records can be retrieved and incorporated into the search or decision making component of the Vocational Exploration file. Other data files include: four-year colleges, community colleges, trade-specialized schools, apprenticeships, military information, financial aids, and local jobs.

The DISCOVER system is an outgrowth of CVIS. The system allows individuals to practice making career decisions. The search strategy employed is based on Holland's Self-Directed Search. There are information files on local jobs, financial aid, apprenticeships, educational programs, including continuing education, and military information. Public schools in Orange, Broward and Dade Counties in Florida have integrated the DISCOVER system into their guidance program. DISCOVER was selected in September, 1980 to be the statewide system for Vermont.

The Educational and Career Explorations Systems (ECES) began experimental operation in 1966 in conjunction with the Advanced System Division of IBM. It has been field tested and revised and is now operating in its fourth version. ECES IV includes a set of experiences in which the student considers his own educationally and vocationally relevant characteristics, a series of exercises dealing with the structure of the world of work, and extensive opportunities to learn about decision-making by manipulating information about potential opportunities.

The System of Interactive Guidance and Information (SIGI) was designed by scientists associated with the Educational Testing Service to assist students in making better career decisions. SIGI emphasizes individual values, contains a vast store of easily retrievable occupational data, and involves a strategy for career planning which uses information about the person and relates it realistically to characteristics and requirements of selected occupations. Users interact with a computer via a cathode-ray tube terminal. SIGI is operating in many colleges and junior colleges.

Over fifty-five school districts in New Jersey use a computerized career guidance system which combines the GIS system with several locally produced units called CACIS. Types of information are data on 1400 occupations, an educational file, a "people-to-visit" file, and a "places" file of resources. The system also includes a media file of published and audio-visual information materials about occupations.

The Milwaukee Computerized Vocational Guidance System helps the individual to narrow career planning choices by focusing on interests, test scores, and job information (Cassel, 1973). Responses to questions about these factors generates a Career Success

Index which matches personal attributes with those common to specific career alternatives.

Another technical method of disseminating occupational information is the Vocational Information for Education and Work (VIEW) system. The VIEW system was designed to collect and convert up-to-date career and labor market information, and to provide information storage, retrieval and dissemination via microfilm. Evaluations of the VIEW system are included in the next section.

2.7 Effectiveness of Computer-based Systems

The studies below are grouped according to the "parent" career information system evaluated in the study, except for the last category which includes two comprehensive studes that compare aspects of several systems.

2.7.1 Research on Effectiveness of Most Widely Used Systems

CVIS (Computerized Vocational Information System)

Harris-Bowlsbey (1972) found that, compared to a control group, high school sophomores who used CVIS increased their vocational maturity and knowledge of occupations. However, there were no differences between the groups on the number of occupations considered as personal options nor in the degree of congruence between aspiration level and objective data about grades and measured ability (realism of choices).

Melhus and Hershenson (1972) tested the hypothesis that CVIS would be more effective with high-ability students than with low-ability students in producing changes in occupational choice.

They found that low-ability students changed more with individual counseling but there were no differences in satisfaction with career choices. The question of whether computerized occupational information is effective with disadvantaged students was addressed by Maola and Kane (1976). They assigned students enrolled in a large urban high school vocational work experience curriculum to individual counseling from either CVIS or a counselor-based information system or to a control group. The groups were post-tested on the Assessment of Career Development to determine which group learned the most information. The results were highly significant, showing a hierarchical effect: the computer group learned more than the counseled group, and the counseled group, more than the control group.

Katz and Shatkin (1980) report that Artunian (1973), investigating the CVIS system, showed that users felt they learned something about themselves, occupations, and the relationship between the two. In addition, it was reported that an overwhelming majority found the occupational briefs interesting and informative.

Harris (1972) reports CACE*(Impelleteri, 1968), CVIS (Harris, 1972) and ECES (Myers, et. al., 1971) data from student questionnaires and/or structured interviews. These studies indicate that:

(a) students have gained an increased awareness in the world of work.
(b) students have received a significant amount of information about vocational and educational alternatives.
(c) students have expanded the number of their vocational options.
(d) students feel a greater ability to make vocational decisions.
(e) students prefer computer exploration of occupational information to exploration by the traditional book and filing cabinet approaches.
(f) students feel that they can more clearly relate abilities and interests to occupational choices.
(g) students have gained in specific knowledge about specific occupations.

CIS (Career Information System)

After comparing the use of CIS with traditional counseling at a community college, Ross (1971) found that CIS was more efficient in delivering occupational information, and that CIS users were as well satisfied as users of the Counseling Center. However, the Counseling Center had more impact on career plans and career certainty than did CIS.

Weick (1972) studied the effectiveness of the Occupational Information Access System (OIAS--the occupational information component of CIS) with employment service clientele. He found that both forms of OIAS (computer-linked and a manual card-sort version) were more effective than a traditional mode (counselor delivery of information) in delivering occupational information for use in the career decision making process.

*Computer-Assisted Career Exploration system was developed at Penn. State University.

User satisfaction was high regarding OIAS.

Wolff (1976) evaluated the use of the Colorado Career Information System (COCIS) at four test sites. Persons using the system included high school students, vocational rehabilitation clients, and clients of a Women's Resource Center. A majority of the users reported that COCIS was easy to use, and that they found the information to be of excellent quality. Over two-thirds of the users changed their occupational preference after using the system and reported greater certainty with the post-treatment preferences.

Rosenberg (1977) conducted a study to assess the impact of employment outlook and occupational information on the career decision-making of college students. The study found that occupational information had an impact on career decision-making of students. The study also found that COCIS is an effective way to transmit information but may have less of an impact in final decisions than group counseling methods. Finally, the study determined that the students who used COCIS gained information relative to careers and occupations.

DISCOVER

Rayman, Bryson and Bowlsbey (1978) studied the effects of a six-week field trial of DISCOVER compared to a traditional guidance program with junior high and high school students. They found that students and parents had favorable responses to the program and thought it useful and fun. Users of DISCOVER significantly increased their specificity of career and educational plans. However, there were no differences between the experimental and control groups on measures of vocational maturity, vocational exploratory behavior, cognitive knowledge of occupations, knowledge and awareness of personal attributes, or decision making and planning skill.

ECES (Educational and Career Exploration System)

Myers, et. al., (1972) investigated the effect a computer-based guidance system has on vocational maturity. Using the Career Development Inventory (CDI) developed and refined by Super, et. al., (1971) the investigators evaluated high school sophomores in 24 schools before and after exposure to the ECES system. The investigators reported an increase in the awareness of a need to plan and an increase in knowledge and use of resources ($p<.01$ on scales A and B on the CDI). However, no increase in decision making skills was found.

Harris (1972) also reported that evidence from the ECES (Myers, et. al., 1972) and CACE (Impelleteri, 1968) systems support the hypothesis that use of the computer system stimulates an increase in exploratory behavior such as use of the school's vocational library and conferences with counselors.

Melhus (1971) in a study of 54 high-ability high school sophomores and 54 low-ability high school sophomores reported that there may be implications for reassignment of guidance department resources; machines may be used with students of higher ability in order to allow appropriation of counselor time with lower ability students. Also, the data indicated that consideration should be given to career guidance programs which combine humans and computers to assist students with vocational planning.

In a report on an extensive field trial of the Educational and Career Exploration System (ECES), Myers et. al. (1972) indicated that ECES users showed larger gains in vocational maturity than nonusers. Specifically, increases in planning orientation and choice and use of resources were exhibited. Users did not differ from nonusers in quality of decision making or amount of occupational information possessed.

The third version of ECES was evaluated in a report by Drake, Friel and Tyler (1976). The results of the evaluation reveals that student users of the system demonstrated a significantly higher level of ability than did nonusers with regard to career knowledge, skills, attitudes, and actions. They found ECES III to be more effective than ECES II.

Katz and Shatkin (1980) reported that Mallory, et. al. (1979) showed that users of ECES IV increased the quantity and quality of their occupational knowledge, gained confidence in their career knowledge, and raised their educational goals.

James and Smith (1972) questioned whether traditional counseling or computer-based guidance would be more effective with disadvantaged eleventh graders in helping them make career choices. They found that traditionally counseled students changed their career choice more than ECES students. Also, ECES was rated as more effective in explaining chances for advancement, salary to expect, tools, etc., while traditional counseling was considered more effective in explaining qualifications necessary for success, education and training needed, and in helping with educational planning.

SIGI (System of Interactive Guidance and Information)

Chapman, et. al., (1977) conducted a formative and summative evaluation of the System of Interactive Guidance and Information (SIGI) at five community colleges. SIGI users differed significantly from nonusers in awareness of career satisfaction, greater reported information-seeking behavior, greater knowledge of occupations of interest, greater confidence in decision-making ability, among other factors.

Willingham (1978) found that high school and community college SIGI users were more aware of their values, had more information about their chosen careers, and were more certain of their college major than a control group.

Tulley and Rossner (1977) compared student reactions to either a traditional guidance program using vocational tests or the use of SIGI for equivalent lengths of time.

There were significant differences between the groups on several outcomes. Among these, SIGI users were reported to have greater information about their chosen occupations, greater satisfaction with their educational and career plans, and increased certainty of choice. There were no differences between the groups in attained grade point average, or in attrition.

Fredericksen (1978) reported that college students who used SIGI gained significantly in their amount of information about occupations, awareness of their values, decision-making ability and specificity of plans.

Finally, Katz and Shatkin (1980) report that Chapman, et. al. (1979) evaluated SIGI at six colleges and found that:

(a) users often credited the system with leading them toward autonomy and rationality in making career decisions.
(b) users gained clearer understanding of their own values, goals, and factors involved in decision making, and acquired more accurate information about occupations they were considering and programs to take.
(c) counselors felt that the system helped them to use their time more effectively and complemented their work.

VIEW (Vocational Information for Education and Work)

English (1974) compared the impact of VIEW with that of a computerized guidance system. The vocational maturity of high school students was the dependent variable. Both VIEW and the Guidance Information System (GIS) were found to increase significantly certain aspects of the vocational maturity of the students under investigation. It was also found that no further increases were obtained by combining usage of both systems or by increasing usage of either.

Gerstein (1969) conducted a two-phase study of the effectiveness of VIEW with high school students. The findings related to the developmental phase indicated that students perceived the VIEW system to be more helpful, understandable, realistic, interesting, complete and up-to-date than other occupational information which they had used previously. In the second phase, a controlled study revealed that students who used VIEW in a formal classroom unit on career planning exhibited significantly greater vocational maturity and knowledge of the labor market than the group which used traditional occupational information in a formal classroom unit on career planning.

Whitfield and Glaeser (1968) summarized data from three experimental studies which evaluated VIEW. They concluded that providing good information does not assure its effective use by counselors and staff, but the VIEW approach was well-liked by students. A survey of Utah high schools conducted by Mogle (1972) found that students did not use the VIEW system and only a small percentage preferred it to other career information materials.

2.7.2 Comparative Studies

Douglas (1977) surveyed counselors, principals, and computer personnel in a comparison of the CVIS, GIS, EUREKA and SIGI computerized career information systems. Results showed that the four computer-based counseling systems surveyed are successful. Each system has limitations which must be carefully understood. Listed below are the major findings of this study:

(a) the use of interactive computer-based systems for vocational and institutional information and selection is tremendously popular with students. The easy, direct display of concise information, as well as the patience of a machine to respond endlessly to repetitive questions, is the primary advantage. In addition, the logical format of the computerized selection process teaches students rational decision making.

(b) counselor support is more cautious than the student support. In almost all of the schools surveyed, one energetic, progressive individual was responsible for use of the system.

(c) the systems are used in varying counseling strategies in different schools.

(d) different parts of each system are used with varying amounts of frequency.

(e) average student usage was approximately 28 students per week per terminal.

The North Carolina Occupational Information Coordinating Committee (1978) compared the following career information systems primarily on a technical basis:

- Orange County, Florida-DISCOVER (high school level) and CVIS.
- Micro Form Data Systems-new concept on image display (ultrastrip).
- Stanford University-Intelligent Computer System (ICS). Coast Community College (District)-DISCOVER (college level).
- Diablo Valley College, California - EUREKA (Career Information System adopted from Oregon).
- University of Oregon, Eugene-Career Information System (CIS).
- Alabama-AOIS/GIS (Guidance Information System)/ CIS (Oregon Career Information System).
- Michigan-MOIS (Michigan Occupational Information System)/COIN (Coordinated Occupational Information Network, Inc.).
- Ottawa, Canada-CHOICES (National Canadian Occupational Information System) (p.4).

They found that:

1. Most of the systems in question have some form of relating occupation selection to interest. Search strategies, utilizing interest, values, and aptitudes are available through online conversations or as a "plus variable" concept provided by tests taken before the session begins. The search strategies within the files rank from good to exceptional, considering the data element volume.

2. Session times on the CRT terminals are generally long, in part due to the sophistication of the software package. The hardcopy terminal option is by far

the most desired capability, provided extensive printing of information does not ensue.

3. The session times are estimated to require from three-fourths of an hour to a maximum of 15 hours. The number of sessions varies from two per hour to ten or twelve, based on the sophistication involved.

4. The data base information content is similar throughout each and every system. The data sources containing national, regional and local information and the unique data base search methods are what distinguishes the system. The credibility of the data is of the foremost importance.

5. The visual display of data and information is a major factor in determining the success of the system. The display of the data on the (CRT) screen and/or hardcopy terminal is varied and dependent on the people's imagination and the machine's capabilities.

6. The Dictionary of Occupational Titles (DOT) numbering system is used in almost all of the systems, with a cross-reference to an internal numbering scheme. We were unable to gather much information on the DOT linkage mechanism within the program software logic.

7. The auxiliary system functions are varied and range from statistical recordkeeping to CAI (Computer Assisted Instruction). We like the concept of user feedback (probably counselor controlled), terse terminal flow, and a user summary profile for the counselors.

8. Several of the delivery software systems have a manual occupational system in the form of a needlesort and/or microfiche options. Such methods are really effective and affordable. These methods generally use national level data and the card decks and fiche are replaced each year.

9. The range of computers and associated hardware varies from mini-computers to large dedicated mainframes, with the mini being the predominant computer. It looks as though a delivery system of some type can be identified for almost any hardware configuration (pp. 8-10).

Virginia and Florida conducted feasibility studies with vastly different outcomes. The Virginia Study (1980) concluded that a system should:

1. possess the capability for making information accessible to a wide variety of persons with varying abilities and experiences.
2. be easy to use, provide written instructions which are clear and manageable, and provide readily accessible information at appropriate reading levels.
3. display and deliver information in an attractive manner.
4. provide accurate, current information which is reviewed and revised at least yearly.
5. supply national, state, and sub-state data.
6. function efficiently, that is, use hardware devices which are reliable, available widely, and applicable.
7. provide information regarding a wide variety of occupations, covering 90 per cent of the total employment in the system service area.
8. provide direct and structured access integrating the occupational information with the client's interests, aptitudes, and abilities.
9. include specific information such as job duties, work environments, hiring and training requirements, outlook, etc. as well as psychological and social aspects of the occupation.
10. possess the capability of being used by persons independently or as part of the counseling process.
11. be attainable in terms of competitive, feasible costs for initiating, maintaining and updating the system.
12. be feasible in the capability of expanding the types and amounts of data in the system.
13. be acceptable to users. (pp. 5,6)

The recommended plan for a Virginia CIDS included three stages of development:

1. the development of state educational and training information and descriptive information about state occupations to be disseminated in microfiche and printed materials;
2. development of school and financial aid information and sub-state occupational information; revision of data collected in phase one
3. preparation of total data bank collected and revised in computer format and language and development of a computerized delivery system.

In essence, the Virginia Study delayed a commercial vendor choice because their investigators hypothesized that, "The rapidly developing technological changes in mini- and micro-computer capabilities will make them more attractive as hardware for CIDS in the future" (p.7). Moreover, they concluded that no commercial vendor had available the educational and occupational data that would meet the needs of a Virginia CIDS.

The Florida report CHOICES Evaluation (1978) focuses on the selection of CHOICES as a statewide system and develops a rationale for applicability of the system to Vocational Education, Florida Employment Service, Vocational Rehabilitation and CETA.

Operating primarily from a technical perspective, the so-called Morgan Report (Morgan Management Systems, Inc., 1978) was one of the most comprehensive studies evaluating and comparing five vocational information systems (CHOICES, CIS, CVIS, MOIS, WOIS) and three career guidance systems (DISCOVER, ECES, SIGI).

The purpose of the study was to "survey and make recommendations on Computer-Assisted Instruction (CAI) languages and Career Guidance Systems (CGS) applicable to the State Employment Service Agency (SESA) operations."

Essentially the study was conducted to explore the feasibility of interest in a "universal" system incorporating CAI and CGS that would serve the U.S. Employment Service and State Employment Security agencies.

A study commissioned by the National Institute of Education (NIE), in conjunction with NOICC (Katz, et. al., 1980), surveys, describes and compares twelve computerized systems, three of which have programs that provide guidance. The study consolidates the literature about career information resources and delivery systems in secondary schools and catalogues the relevant publications, audio-visual materials and programs for delivery of occupational information. A comprehensive treatment of services provided by secondary schools, the report provides useful data for states establishing a statewide CIDS.

2.8 The Information Component

Ultimately, the success or long-term effectiveness of an information delivery system is dependent on the quality of the information disseminated. Not only must the labor market data be current and reliable, it must be presented in a manner that is understandable to counselors and clients. Attention to the labor market information needs of various constituents from professional planners and counselors to students and clients has resulted in statewide information needs studies (Thal-Larsen, Laner and Mayall, 1972; Probst and Meredith, 1979; Hattwick, Thistlethwaite and Beveridge, 1979) and a national symposium and monograph (ETA, 1980).

The NOICC and the SOICCs were established with the chief mandate of improving coordination between, and communication among, occupational data producers and occupational data users. The literature related to the development of the NOICC/SOICC network, discussed earlier, attests to the consistent emphasis on high standards for data collection, classification and presentation.

Since state-specific data is a critical aspect of a CIDS, statewide information needs assessments contribute to knowledge of system planners in respect to the range of occupational information users, optimal delivery modes, currently unsatisfied needs for occupational and career decision-making related information and most easily interpreted and usable information formats.

The study conducted in California by Margaret Thal-Larsen and others pointed out in 1972 the need for a structure or system that determines gaps, assesses needs for various types of information and develops criteria for data collection. According to the study, labor market information should include current job opportunity information, future job prospects and trends, local labor market situations, current demographic and economic information, community resources and facilities, information about industries, i.e. hiring practices, licensing requirements, placement and job search.

Advocated by the California Study (Ventura, 1979) was a "closer liaison than now exists between organizations and agencies representing the major sources, processors, and users of labor market information for the purpose of eliminating duplicative contacts on da sources, devising coding and classification structures and other procedures permitting them to share the data they acquire, working out efficient divisions of labor so that cost efficiencies may be achieved in the development of certain subsystems, and conducting the research and experimentation necessary to ensure that such information output as can be jointly developed will meet the needs of the associated intermediaries and the direct participants they serve." (pp. 20,21)

A later study conducted in North Carolina reinforced the need for a multi-purpose occupational information system by an assessment study of user needs and data availability. This study conducted in 1977-78 by the North Carolina State Occupational Information Coordinating Committee, concentrated on the information needs of five state agencies: Vocational Education, Community Colleges, CETA, Vocational Rehabilitation and Employment Service (state and local).

Of considerable interest to the CIDS Feasibility Study research team was the Illinois Occupational Information Needs Study conducted at Western Illinois University, sponsored by the Illinois Department of Commerce and Community Affairs. Thirteen different types of agencies were surveyed in this comprehensive study: area secondary vocational centers, career guidance centers, CETA offices, community action agencies, the Department of Rehabilitation Services, high school counseling offices, the Job Service, regional planning commissions, regional vocational administrators, various state offices, trade schools, and college and university placement offices.

2.8.1 The 1979 Illinois Occupational Information Needs Study

The five-volume study concentrates on such factors as types of agencies, assignments, unmet needs for characteristics and Career Information Systems. The findings of this study most germaine to the establishment of an Illinois CIDS are the following:

1. Only 23% (a total of 769 persons responded) used a Career Information System.
2. Of those using a particular system, at least 75% indicated that they were either "Very satisfied" or "Somewhat satisfied" with its use.
3. The two most important unsatisfied needs for demographic characteristic information were educational attainment and limited English proficiency.
4. Fifty percent or more of the respondents indicated a preference for data to be broken down by county, occupational cluster, industry and city.
5. The three occupational supply/demand characteristics desired by the majority of respondents: job requirements, number of job openings and wage rate.
6. Interest in data concerning job openings exceeds that of turnover.
7. An annual updating of information was preferred by the greatest percentage of respondents.

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3.0 Vendor Directory

3.1 Introduction

The purpose of this part of the report is to present the collected data on all the vendor systems. This is accomplished in several ways.

First, some relationships are drawn among the systems by showing a timeline for the availability of the systems and by grouping the systems and listing the common characteristics of each group.

Next, each of the vendor systems: AEL, CHOICES, CIS, COIN, CVIS, DISCOVER, ECES, EXPLORE, GIS, SCAD, SEARCH, SIGI, VIEW, VIP and VOCOMP is described in detail. The important features of each system, including its design and function, data files and hardware and software, are outlined.

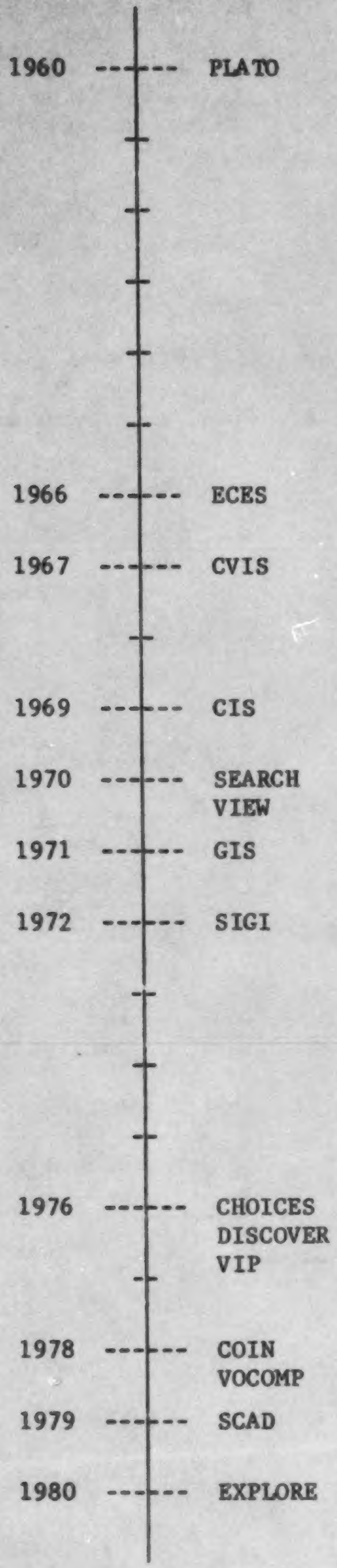
Third, examples of possible configurations are discussed. Telecommunication-based networks, as well as non-connected networks, are outlined. A feasibility study for two statewide microcomputer delivery system is also presented. Two non-computer delivery models, including a paper and/or microfiche model and a referral system, are discussed as well.

Finally, issues concerning hardware and software compatibility are raised; these include the vendor system, hardware, available resources and configuration schemes. A chart showing the compatibility of the computerized vendor systems with various mainframes and minicomputers is also presented.

3.2 Relationships among Systems

The following charts attempt to describe the vendor systems, computerized and non-computerized, in various ways. The first chart is a timeline which shows the year in which each system became available. The second chart tries to group the vendor systems and identify the characteristics common to each group. The third chart gives the marketing agents for each system.

3.2.1 Timeline for Career Information Delivery Systems*


1960 PLATO
1966 ECES
1967 CVIS
1969 CIS
1970 SEARCH VIEW
1971 GIS
1972 SIGI
1976 CHOICES DISCOVER VIP
1978 COIN VOCOMP
1979 SCAD
1980 EXPLORE

*Information on AEL currently unavailable

3.2.2 System Characteristics Chart

TYPE	SYSTEMS	COMMON CHARACTERISTICS
— batch -- information storage and retrieval	SEARCH VIP VOCOMP (voc. rehab. only)	-- user has no direct contact with the computer -- user completes a questionnaire with the desired characteristics of an occupation and/or a school -- a list of schools and/or occupations with the desired combination of characteristics is printed -- least expensive way of using a computer to provide career guidance information
-- online information storage and retrieval	CHOICES CIS COIN CVIS ECES GIS SCAD	-- interactive, structured interviews between user and computer -- sophisticated search strategies which allow: constant knowledge of the effect of each choice made, opportunity to erase former choices and redo searches with different sets of characteristics
-- online information systems that deliver significant guidance content beyond career information	DISCOVER EXPLORE SIGI	-- provides: computer-assisted instruction; simulation exercises in areas of value clarification, decision making and classification of occupations -- assistance in assessment of current status of career development -- online administration and interpretation of testing instruments

Based on:

Rayman, Jack R., Bryson, Doris L. and Harris-Bowlsbey, JoAnn. The field trial of DISCOVER: A new computerized interactive guidance system. The Vocational Guidance Quarterly. June 1978, 349-360.

Rayman, Jack R. and Harris-Bowlsbey, JoAnn. DISCOVER: A model for a systematic guidance program. The Vocational Guidance Quarterly. September 1977, 3-12.

3.2.3 Vendor Summary Sheet

VENDOR SYSTEM	DEVELOPER/REPRESENTATIVE
AEL (Appalachia Educational Laboratory)	McKnight Publishing Co. Bloomington, IL •print system only
CHOICES — 1976 (Computerized Heuristic Occupational Information and Career Exploration System)	Phillip S. Jarvis, Senior Consultant Canada Systems Group 90 Sparks Street, Suite 704 Ottawa, Ontario K1P 5B4 613/563-4444 Thomas M. Moore, Managing Partner DMR & Associates 112 Kent Street, Suite 2218 Ottawa, Ontario K1P 5P2 613/238-2697
CIS — 1969 (Career Information System)	Dr. Bruce McKinlay Oregon CIS 247 Hendricks Hall University of Oregon Eugene, Oregon 97403 503/686-3111
COIN — 1978 (Coordinated Occupational Information Network)	Dr. Rodney Durgin COIN, Inc. 1230 West Wooster Bowling Green, OH 43402 419/352-8431
CVIS — 1967 (Computerized Vocational Information System)	Carol M. Rabush CVIS Distribution Center Western Maryland College Westminster, MD 21157 301/848-1113

3.2.3 cont'd

VENDOR SYSTEM	DEVELOPER/REPRESENTATIVE
DISCOVER -- 1976	Dr. JoAnn Harris-Bowlsbey DISCOVER Foundation, Inc. P.O. Box 363 Westminster, MD 21157 301/848-1113 IBM Corporation 1133 Westchester Ave. White Plains, NY 10604
ECES -- 1966 (Educational and Career Exploration System)	Dr. Alva E. Mallory, Jr. Genesee Intermediate School District 2413 West Maple Ave. Flint, MI 48507 313/767-4310
EXPLORE -- 1980	Dr. JoAnn Harris-Bowlsbey Mr. Charles Maloy Towson State University Counseling Center Towson, MD 21204 301/321-2512
GIS III -- 1971 (Guidance Information System)	Linda Kobylarz TimeShare Corporation 630 Oakwood Avenue West Hartford, CT 06110 203/522-0136
SCAD -- 1979 (Student Career Assessment and Determination)	Lawrence G. Lloyd, Senior Consultant Evaluation Techniques Consortium 9950 Topanga Canyon Blvd. Chatsworth, CA 91311 213/882-6622
SEARCH -- 1970 (System Exploration and Research for Career Help)	State of Oregon Employment Division Department of Human Resources 875 Union Street, N.E. Salem, OR 97311 503/378-8289

3.2.3 cont'd

VENDOR SYSTEM	DEVELOPER/REPRESENTATIVE
SIGI -- 1972 (System of Interactive Guidance and Information)	Dr. Martin R. Katz Educational Testing Service Princeton, New Jersey 08541 609/921-9000
VIEW -- 1970 (Vital Information for Education and Work)	Center for Career Development Services Florida Department of Education Division of Vocational Education Tallahassee, FL 32301 904/488-0400 800/342-9271 'microfiche system only
VIP -- 1976 (Vocational Information Program)	John Cripe, VIP Coordinator Data Processing Department Joliet Junior College 1216 Humboldt Ave. Joliet, IL 60436 815/729-9020
VOCOMP -- 1973	Gary and Marjorie Golter Innovative Software 19824 Ventura Blvd. #102 Woodland Hills, CA 91364 213/884-5581

3.3 Vendor Descriptions

This section describes each system in detail. The information presented is organized into ten categories:

- NAME
- DEVELOPED BY
- MARKETED BY
- DESIGN/FUNCTION
- DATA FILES
- GEOGRAPHIC SPECIFICITY
- CLASSIFICATION SYSTEM UTILIZED
- OTHER COMMENTS
- COST
- HARDWARE AND SOFTWARE

This information was gathered from various sources; these sources are listed at the end of Section 3.

3.3.1 AEL

NAME: Appalachia Educational Laboratory (AEL)

DEVELOPED BY: Appalachia Educational Laboratory

MARKETED BY: McKnight Publishing Company
Bloomington, Illinois 61701

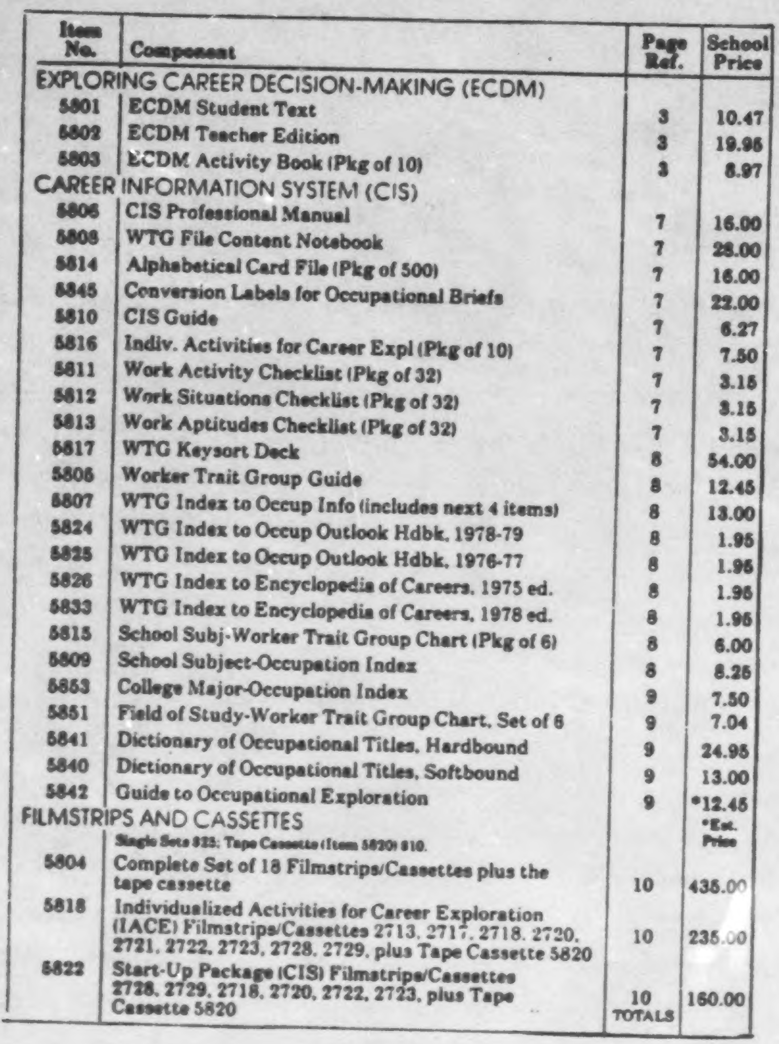
DESIGN/FUNCTION: The AEL Career Information System (CIS) is an organization and management system for career information resources. In addition, the system contains self-assessment and access variables to assist individuals in developing an understanding of self in relation to groups of related occupations (Worker Trait Groups - WTG). The system is based upon the Department of Labor 12 Career Area/66 WTG structure. All occupational information available in any setting can be included in the system. Thus, computerized occupational information systems can be a subsystem within the AEL-CIS. The basic elements in the system's program materials are based on many years of DOL research which has generated the base occupational data used in most existing occupational descriptions. The major purpose of this system has been to translate the DOL research into a format usable by high school students and adults in a variety of settings, including employment service, rehabilitation, etc. and to link the materials to educational programs, courses and taxonomies. Accessing of information in the AEL-CIS is to the related WTGs, then to the occupational level in all available resources. AEL uses printed materials, needlesort decks, filmstrips and cassettes.

DATA FILES: WTG descriptions rather than occupational descriptions are used in this system.

GEOGRAPHIC SPECIFICITY: National level

CLASSIFICATION SYSTEM USED: DOT, HEGIS. AEL is working with West Virginia to develop SOC descriptions.

COST: Operation cost per student not estimated. Career decision-making materials are optional and available through McKnight Publishing Company. Their price list is reproduced below.



Item No.	Component	Page Ref.	School Price
EXPLORING CAREER DECISION-MAKING (ECDM)			
5801	ECDM Student Text	3	10.47
5802	ECDM Teacher Edition	3	19.95
5803	ECDM Activity Book (Pkg of 10)	3	8.97
CAREER INFORMATION SYSTEM (CIS)			
5805	CIS Professional Manual	7	16.00
5808	WTG File Content Notebook	7	28.00
5814	Alphabetical Card File (Pkg of 500)	7	16.00
5845	Conversion Labels for Occupational Briefs	7	22.00
5810	CIS Guide	7	6.27
5816	Indiv. Activities for Career Expl (Pkg of 10)	7	7.50
5811	Work Activity Checklist (Pkg of 32)	7	3.15
5812	Work Situations Checklist (Pkg of 32)	7	3.15
5813	Work Aptitudes Checklist (Pkg of 32)	7	3.15
5817	WTG Keysort Deck	8	54.00
5806	Worker Trait Group Guide	8	12.45
5807	WTG Index to Occup Info (includes next 4 items)	8	13.00
5824	WTG Index to Occup Outlook Hdbk, 1978-79	8	1.95
5825	WTG Index to Occup Outlook Hdbk, 1976-77	8	1.95
5826	WTG Index to Encyclopedia of Careers, 1975 ed.	8	1.95
5833	WTG Index to Encyclopedia of Careers, 1978 ed.	8	1.95
5815	School Subj-Worker Trait Group Chart (Pkg of 6)	8	6.00
5809	School Subject-Occupation Index	8	8.25
5853	College Major-Occupation Index	9	7.50
5851	Field of Study-Worker Trait Group Chart, Set of 6	9	7.04
5841	Dictionary of Occupational Titles, Hardbound	9	24.95
5840	Dictionary of Occupational Titles, Softbound	9	13.00
5842	Guide to Occupational Exploration	9	*12.45
FILMSTRIPS AND CASSETTES			*Est. Price
	Single Sets $25; Tape Cassette (Item 5820) $10.		
5804	Complete Set of 18 Filmstrips/Cassettes plus the tape cassette	10	435.00
5818	Individualized Activities for Career Exploration (IACE) Filmstrips/Cassettes 2713, 2717, 2718, 2720, 2721, 2722, 2723, 2728, 2729, plus Tape Cassette 5820	10	235.00
5822	Start-Up Package (CIS) Filmstrips/Cassettes 2728, 2729, 2718, 2720, 2722, 2723, plus Tape Cassette 5820	10	160.00
		TOTALS	

HARDWARE AND SOFTWARE: No hardware needed

3.3.2 CHOICES

NAME: Computerized Heuristic Occupational Information and Career Exploration System (CHOICES)

DEVELOPED BY: Phillip S. Jarvis for the Canada Employment and Immigration Commission

MARKETED BY: Canada Systems Group (CSG)*
90 Sparks Street, 7th Floor
Ottawa, Ontario
K1P 5K4

DMR & Associates*
112 Kent Street, Suite 2218
Ottawa, Ontario
K1P 5P2

DESIGN/FUNCTION: CHOICES is an interactive computerized system for retrieval of career information. People communicate directly with the computer in a conversational mode, with the computer addressing them by their first names. Through exploration, the user can examine ways in which his own interests, ambitions, expectations, and educational aspirations influence the range of opportunities available to them. CHOICES was designed to meet Canada's labor needs through matching of jobs and workers and to reduce unemployment.

Information can be obtained by a direct approach, knowing the specific information desired, that is, occupational title, school, etc. or a structured approach through exploration routes designed in a cartoon-type travel guide. Direct access is performed by the SPECIFIC module, where the user has a choice of any or all of thirteen topics of information about any occupation. The COMPARE module permits the user to compare either two or three occupations at a time on any of the thirteen topics. In this module, a one-sentence description is printed for each occupation followed by the requested topics in parallel columns.

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*As of September, 1980 the operational responsibilities between these two organizations have changed. Therefore, the purchase arrangements for CHOICES are uncertain.

The structured search is performed through the EXPLORE route that allows the user to specify from as many as twelve categories of characteristics. The RELATED module, which allows the user to investigate related occupations, has nine categories of characteristics to choose from.

The categories of occupational information which can be accessed through EXPLORE, SPECIFIC, COMPARE and RELATED are listed below.

TOPICS	EXPLORE	SPECIFIC	COMPARE	RELATED
Interests	x	x	x	x
Aptitudes	x	x	x	x
Temperaments	x	x	x	x
Environmental Conditions	x	x	x	
Employment Outlook	x	x	x	x
Wage/Salary	x	x	x	x
Hours of Work/Travel	x	x	x	
Physical Demands	x	x	x	x
Physical Activities	x	x	x	
Inside/Outside Considerations	x	x	x	x
Work Fields	x			x
Training Time		x	x	
Similar DOT Occupations		x	x	

DATA FILES: Two major files

(1) Occupational File: (12 exploration routes)

- Occupational titles (Canadian Classification and Dictionary of Occupations)
- Occupational interests
- Occupational aptitudes
- Temperaments
- Education level
- Environmental conditions
- Employment outlook
- Wage/Salary

- Hours of work/travel
- Physical demands
- Physical activities
- Inside/outside considerations
- Work fields (CCDO Major groups)

(2) Educational/Training Institutions File: This file also has explanatory routes which can be utilized in the same manner as the Occupational file exploratory routes.

GEOGRAPHIC SPECIFICITY: DMR will modify the Canadian data files in the near future. Specifically, it will 1) replace the Canadian occupational code numbers with SOC codes, 2) the data will be reviewed and changed, when necessary, to reflect the realities of the U.S. labor market. DMR will update the national files. User agencies can either develop the local data files themselves, or contract with DMR to furnish this service.

CLASSIFICATION SYSTEM UTILIZED: SOC codes are now available as a result of North Carolina's work in this area.

OTHER COMMENTS:

- A significant enhancement to CHOICES is the work done by North Carolina to include educational information and daily Job Bank listings. The same access formats will be used for these additional files.

- As already stated, North Carolina has modified the occupational file to include the 4-digit SOC code.

- A cooperative arrangement has been worked out through a consortium of states using CHOICES to share enhancements on a minimal cost basis, to cover the expenses of creating computer tapes and duplicating support documentation. The states involved are Delaware, Florida, Kansas and North Carolina.

- A unique feature of CHOICES is its summary sheet printed at the end of a client's session to provide the counselor with key information on the client's inquiries.

COST: The costs and policies for acquiring CHOICES which are stated here were in effect as of August, 1980. However, the marketing situation for CHOICES has changed subsequently, so that these policies and costs are subject to change.

As of August, 1980, DMR & Associates handled the source code licensing, while CSG handled the timesharing services.

- DMR & Associates

--For a $1,000 fee the source code for CHOICES can be obtained, along with supporting documentation. This fee applies to each mainframe on which CHOICES would be run. There would be no other required fees and the state would become a member of the CHOICES consortium.

--Enhancements to CHOICES done by states in the consortium would be available to other states in the consortium for a minimal reproduction fee.

--All data updates would be the responsibility of the state.

--Other consulting services, such as technical support or staff training, could be contracted through DMR.

- CSG

--For $500 per month, CSG would provide computer terminal rental, data line and use of CHOICES.

--The hours for CHOICES availability are subject to negotiation with CSG.

HARDWARE AND SOFTWARE: CHOICES is written in COBOL and can be run on:

1) Any IBM system which supports CICS/VS and DL/1. These include: the 370 series, 303X series and the 4300 series, with an IBM 3705 or equivalent control unit. Forty megabytes of online storage for the data files and 800K bytes of memory are required.
2) Any BURROUGHS B6700/B6800 system. Twenty-five megabytes of online storage and 720K bytes of memory are required.

Teletype 43 (point-to-point) and IBM 3767 (multi-drop) hardcopy terminals will support the 120-character print line of CHOICES script.

A DMR study is underway for installation of the package on mini and microcomputers.

3.3.3 CIS

NAME: Career Information System (CIS)

DEVELOPED BY: Dr. Bruce McKinlay and staff at University of Oregon Research Center

MARKETED BY: Oregon CIS
Hendricks Hall
University of Oregon
Eugene, OR 97403

DESIGN/FUNCTION: CIS is an interactive system for career information retrieval. It was first developed in Oregon and has been implemented by thirteen states and one large city: Alaska, California (EUREKA), Colorado, Hawaii, Georgia, Idaho, Iowa, Minnesota, Montana, Nebraska, New York City (MetroGuide), Oregon, Washington, Wyoming.

A user may access information through the direct approach or use the structured access strategy called QUEST to provide direction for gaining access to occupational information. QUEST is a 21-item inventory of user preferences, including temperaments, aptitudes, education level, physical demands, work setting and earnings. This questionnaire can be completed online or beforehand.

The structured search is quite flexible. With the SELECT command, the user may select any combination of QUEST items to be used. If the user wishes to complete the entire inventory, he/she can ask HOW MANY or LIST and receive the number of occupations or the actual list of occupations, respectively. The BACK UP command allows a change in response to the previous question, while the CHANGE command allows a change in any question. The START OVER command allows the user to begin again. The NS (not sure) response to any item allows that item to be skipped. Once the user has obtained a list of occupations, the WHY NOT feature allows him/her to find out why a particular occupation was not included in the list.

To directly access information, the user has several options: INFO will give the user a list of all the files; DESC nnnn will give a description of the occupation whose code is nnnn. PROG nnnn and SCH nnnn will give program descriptions for education and training and information about postsecondary schools. The codes for occupations, programs and schools are different and all are listed in the User's Handbook. To access any file, the user need only type in the file abbreviation. The computer will prompt for the required information.

An additional feature of CIS is the cross-walk among files. Each occupational description (DESC nnnn) includes references to Preparation (PREP) scripts and to DESC scripts of related occupations. PREP scripts provide references to educational program (PROG) scripts, while PROG scripts provide references to DESC scripts and to related PROG scripts.

DATA FILES:

(1) Description: occupational descriptions
(2) Bibliography: information on publications for each occupation
(3) Visit: names of local people to contact who are engaged in each occupation (state must collect own data)
(4) Clubs: lists of career exploratory clubs in the state (state must collect own data)
(5) Preparation: information on preparation for occupational entry, including needed skills and licensing
(6) Program: postsecondary educational programs and training
(7) School: information on 2- and 4-year colleges in the state
(8) Financial Aid: information about sources of financial aid
(9) EMPL 1000: local summer jobs (state must collect own data)

GEOGRAPHIC SPECIFICITY: There is no national occupations data file; instead, each state develops its own state-specific occupational file. The Oregon CIS staff will provide assistance in setting up the necessary procedures for each state to collect and analyze labor market information.

The school file is currently state-specific and the Oregon CIS will assist each state in this area as well. The Oregon CIS is working on a national school file and it should be complete within the next year.

CLASSIFICATION SYSTEM UTILIZED: CIS software, writing guides, and technical papers give the analyst compatibility with DOE, OES, Career Cluster and HEGIS-based data.

OTHER COMMENTS:

- The CIS states have formed a consortium in order to pool their resources in supporting research and development for CIS. Some enhancements are developed by the Oregon CIS staff, while others are developed by individual states.

- The Oregon CIS staff is developing a national 4-year college file, to be completed within the next year.

COST: The costs for CIS are divided into several components:

- $3500 annually for research and development support. This fee is paid by all CIS states to share resources and to permit system improvements.

- $7000 initial fee for the first language version (FORTRAN or BASIC). This fee includes the first year maintenance.

- $5000 initial fee for a second language version (FORTRAN or BASIC) if desired. This fee also includes the first year maintenance.

- $2500 initial fee for each subsequent dialect version, an adaptation of a principal language version.

- $1000 annually (after the first year) for software maintenance.

- $1000 for a demonstration copy, maximum of one year.

HARDWARE AND SOFTWARE: The Career Information System has been installed on several large timesharing systems, including DEC System 10, Honeywell 6600 series, Honeywell Sigma 6 and CDC Cyber 70. It has also been installed on several minicomputer systems, including DEC

PDP-11 RSTS, HP 2000F, HP 2000 ACCESS, HP 3000 and the Data General Eclipse. An IBM version also exists. A microcomputer version of CIS is planned.

CIS is written in FORTRAN IV and BASIC. The FORTRAN IV version was designed to be transportable and machine-dependent statements and routines have been identified for ease in conversion. The system runs in 16K, 36-bit words on the DEC System 10 and 12K, 60-bit words on a CDC Cyber System. The data files require from 3 to 6 million characters of disk storage. Programs for update and maintenance are operational on the System 10, Cyber and Honeywell 6600. Routines to collect and report statistical information are being developed.

The BASIC version was designed for the HP 2000F, 2000 ACCESS and 3000. The programs and files required to run the CIS system require approximately 9000 blocks of disk storage, or about 3 to 5 million characters. Programs and files used to update and maintain the system (at the state level) require an additional 200 blocks. A small amount of storage at each installation can be used to collect statistical information on use of the system.

The CIS system is designed to be accessed with a hardcopy terminal, usually over phone lines. Several types of terminals can be used; the most frequently used are asynchronous terminals, run at 300 baud.

3.3.4 COIN

NAME: Coordinated Occupational Information Network (COIN)

DEVELOPED BY: Dr. Rodney W. Durgin

MARKETED BY: Coordinated Occupational Information Network, Inc.
1230 West Wooster
Bowling Green, OH 43402

DESIGN/FUNCTION: COIN is an interactive guidance system for retrieval of career information. It is statewide in South Carolina. The COIN occupational search allows the user to create an occupational profile based on: interests, working conditions, career clusters, education, physical strengths, physical demands and salary. The users have the option to select only data important to them by ranking the above seven areas. As each characteristic is entered, the user gets the number of occupations remaining. The user may request a list of these occupations at any time. The user may also ask why an occupation did not appear on his/her list; all the characteristics chosen thus far will be listed and the non-matching characteristics will be noted.

A streamlined version of the search has been developed which allows the user to enter an entire profile of characteristics, or any subsets, at once. As the occupations file is searched, the number of remaining occupations is given.

The postsecondary school search is based on region of the country or states within a region. Seven search characteristics can be used: admissions selectivity, type of school, size, size of surrounding community, affiliation, cost and major.

The school subjects file offers a two-way search: for occupations related to a school subject that the user specifies and for school subjects related to an occupation that the user specifies.

The direct access approach consists of entering an occupational code. The user will get a brief description, then a list of specialties subsumed under this occupation, then related COIN files and related COIN occupational descriptions. The user may then ask for one or more of seven categories of additional information. All information in the educational files may also be accessed directly.

COIN also incorporates cross-walks among files, so that the basic occupational description provides references to related occupations and related scripts in other files. The apprenticeship and college major scripts include references to related occupational descriptions. Postsecondary school descriptions list majors by the codes used in the college majors file. At the end of each item of information, a set of options is given the user which allow a direct link to all related files of information specific to that occupation, without having to specify the occupational code each time.

Another feature of COIN is that it is a dual system, utilizing the computer as a stand-alone system or in conjunction with the COIN microfiche system. The interactive system is cross-referenced to the microfiche data base and directs users to information in that system. In addition, COIN also offers a remote batch capability through a self-administered occupational search questionnaire utilizing mail delivery.

DATA FILES:

(1) Occupational File: describes major occupations and their specialties

(2) College Major File: descriptions of related postsecondary education and training programs

(3) School File: descriptions of 2-year and 4-year public and private colleges and universities

(4) Apprenticeship File: description of national apprenticeship training programs related to COIN occupations

(5) Military File: descriptions of military occupations and training opportunities related to COIN's civilian occupations

(6) School Subject File: information on high school subjects related to COIN occupations

The files are updated annually.

GEOGRAPHIC SPECIFICITY: National information for occupations, college majors, apprenticeship, military training and postsecondary schools.

Addition of local wages, local outlook, and local training program data is permitted. Responsibility to collect, build and maintain these files is a local one. However, COIN optionally provides customized local files.

CLASSIFICATION SYSTEMS UTILIZED: DOT and USOE

COST: Excerpt from letter of June 19, 1980 from Rodney W. Durgin, Director of COIN Program: "For state system delivery, the cost for our program is dependent upon a number of variables. Included among these are: number of user sites; local data development; utilization of either the COIN interactive system, the COIN microfiche system, or both."

HARDWARE AND SOFTWARE: The following information is taken from the COIN Interactive System Identification Sheet:

Compatible hardware:
Hewlett-Packard 3000 Series
Hewlett-Packard 2000 Series
Prime 400 Series
IBM 360 & 370 Series
UNIVAC 1100 Series
Honeywell 6000 Series
Digital Equipment Corp.: System-10, PDP-11 Series and DEC 20

		Sold	Leased
Hardware:	Terminals	yes	yes
	Computers	no	no

Software Considerations: Disk file space required is 6.5 million characters for all files that are open at run time.

Language: BASIC, FORTRAN IV

Potential for Vendor Independence: Package would be adaptable to any system having BASIC IV, but file access and communications software would not be vendor independent; it would be modified by COIN and made operational.

3.3.5 CVIS

NAME: COMPUTERIZED VOCATIONAL INFORMATION SYSTEM (CVIS)

DEVELOPED BY: Dr. JoAnn Harris-Bowlsbey

MARKETED BY: CVIS Distribution Center
Carroll Hall
Western Maryland College
Westminster, MD 21157

DESIGN/FUNCTION: CVIS is an interactive computer-based system for retrieval of career information which attempts to provide an organized approach to exploration of over 430 occupations and to educational alternatives. This systematic approach assists students to either broaden or narrow their career and/or educational plans.

There are four versions of CVIS: Evansville, Hampton, RECAP and Slippery Rock. These versions differ in the availability of local data files, use of student records and use for administrative functions. The following discussion refers to the Slippery Rock version primarily.

CVIS permits both direct access and structured search. To search among occupations, users have two options: Student Scripts and Occupational Retrieval. In the Student Scripts route, students first estimate which quarter of their graduating class they rank in (by grades) and which quarter of students nationwide they rank in (by test scores) and second, specify one of six types of postsecondary education and/or training they are interested in. The computer comments on the appropriateness of the user's selection. based on the user's previous responses. The user then selects one of eight interest areas. Based on interest and postsecondary plans, the computer presents a list of occupations. Responses can be changed and a new list of occupations obtained.

The Occupational Retrieval route is a brief process, based on the user's choice of occupational characteristics. Once these are entered, the computer again presents a list of occupations.

Once an occupations list is obtained from either route, the user may obtain a description of each occupation via direct access.

The college search also offers two options: College Selection and College Retrieval. The College Selection route allows the user to enter as many as seven specifications. The computer responds with how many colleges remain feasible after each specification is entered. The computer also provides a structured search among the 99 possible college majors; students select one of the 20 categories of majors and then choose a major within the category or students select one of the occupational interest areas and then receive a list of appropriate categories of majors. Once the student has finished entering specifications, the computer will respond with a list of colleges and their school codes. Students can alter their responses and receive a revised list in this module as well.

The College Retrieval is the parallel short route for college selection. The user enters specifications and once he/she is finished, the computer returns a list of colleges and school codes.

Direct access for occupations or colleges consists of typing in the code number within the proper file.

Other information, such as on apprenticeship or military opportunity, is introduced with a teaching quiz.

Determination of values is based on the Holland categories, while exploration of occupations is based on the Roe classification system.

Some versions of CVIS have the capability of storing student/client records, so that self-assessments can be checked against records and progress of users can be monitored.

DATA FILES:

(1) Occupations: description of occupations

(2) Four-year Colleges: includes information on college planning

(3) Apprenticeship: national information, as well as any local programs, if data supplied

(4) Military: national information

(5) Technical Specialized Schools: local information

(6) Financial Aid: national information as well as local information if data supplied

(7) Community Colleges: local data, if supplied

(8) Jobs: local data, if supplied

Additional local files --

(1) Select-a-Course: graduation requirements, review of progress

(2) Local child care services

(3) Supportive services for adults

GEOGRAPHIC SPECIFICITY: Occupations, four-year colleges, apprenticeship and military data files all reflect national information. Other files require input of local data.

OTHER COMMENTS:

- The CVIS Consortium, a non-profit organization, performs several tasks: distributes the CVIS product, updates the national occupational and college files, shares new developments among users at nominal cost, provides avenues for communication among CVIS users through quarterly newsletters, an annual meeting and other informal channels.
- National data for CVIS is supplied by the DISCOVER Foundation, Inc.
- Other components may be added to CVIS using the author language.

COST: The initial acquisition costs range from $1100 to $1450 per CPU, depending on the particular version of CVIS. Recurring costs are as follows:

college file update	$200 annually
CVIS Consortium member dues	$350 annually
occupational file update	$300 bi-annually

3.3.6 DISCOVER

NAME: DISCOVER

DEVELOPED BY: Dr. JoAnn Harris-Bowlsbey

MARKETED BY: DISCOVER Foundation, Inc.
P.O. Box 363
Westminster, MD 21157

IBM Corporation
1133 Westchester Ave.
White Plains, NY 10604

DESIGN/FUNCTION: Development of DISCOVER began in 1972, with funding from three principal sources: The Illinois Division of Vocational and Technical Education, the U.S. Office of Education (Vocational Education Part C research monies) and IBM Corporation.

DISCOVER is a systematic career guidance program designed to enhance career development for grade seven through twelve students in the secondary version, and for college students and adults in the college/adult version. The developers of DISCOVER believe that a career guidance system should include at least the following components:

- Self-information, including values, interests and competencies
- Exploration of occupations in a systematic way
- Teaching and low-risk practice of decision-making
- Relationship of self-information to occupational alternatives
- Informational assistance with implementation of choice.

The DISCOVER system is divided into 17 modules, five of which are specific to the secondary level, five exclusively for the college/adult level, and seven common to both levels. The ENTRY module introduces the student to the system and use of the 3270 terminal. In addition, it performs the recordkeeping functions of the system. An online survey of career development is available within this module.

The remaining 16 modules fall into three major categories: values and decision-making education, relating and exploring occupations, and career planning.

Values and Decison-Making Education

• Understanding My Values (Secondary) contains experiences that encourage the student to think about what a value is, to analyze personal values and to decide upon actions to implement those values. A computer search of occupations based upon work-related values can be made.

• Clarifying Values (College/Adult) contains a number of experiences that lead the user to think about what a value is, to analyze personal values and to decide upon actions to implement those values. The user is provided with the opportunity to construct a lifeline and to identify critical points on that personal lifeline where he/she exercised personal control and where the environment exercised control. Emphasis is placed on a person's "use of time" as the ultimate expression of personal values.

• Playing a Values Game (Secondary) is a board game designed to reinforce the teaching of work values and to assist students to relate these values to specific occupations.

• Values and Occupations (College/Adult) defines nine specific occupationally-related values. These definitions are followed by a series of exercises to help the user develop a good understanding of the nine occupationally-related values. The student may then rate the personal importance of each of these nine values and then ask the computer to search its data file for occupations that can provide the combination and weighting of the values assigned. The list of occupations thus generated is retained for later use in the system.

• Learning to Make Decisions (Secondary) teaches a methodology for decision-making.

• Effective Decision-Making (College/Adult) attempts to teach an approach to decision-making by presenting the steps of the decision-making process in example and flowchart form. The system provides a number of exercises designed to illustrate and provide practice in several different decision-making strategies and assists the user in identifying his/her present style of decision-making.

• Practicing Career Decisions (Secondary) uses a career decision tree as an organizational principle for understanding how decisions affect occupational choice. Key decisions that lead to entry into given occupations are illustrated. The student may play his/her own life in a variety of ways by making decisions in this low-risk simulated way.

• Decision-Making and Careers (College/Adult) teaches the process nature of decision-making by means of a polygonal model based on Dr. David Tiedeman's decision-making paradigm. It helps the users identify the critical decision points in the decision-making process through several case studies. Finally, the module makes use of a career decision tree as an organizing principle for understanding how decisions affect occupational choice. The tree structure is used 1) to show the key decisions that lead to occupational entry, 2) to plot a given user's course up the branches of the tree, 3) to simulate the career paths of others and 4) to provide the user with a low-risk opportunity to play his/her life in a variety of ways.

Relating and Exploring Opportunities

• Learning How Occupations Can Be Grouped (Secondary) presents the world of work by way of two organizing principles: the data-people-things-ideas division and the Holland system. A number of exercises are presented to give the student practice at using these classification systems; the student's responses are monitored for the purpose of providing more instruction if needed.

• Organization of the Occupational World (College/Adult) presents the world of work by way of two organizing principles: the data-people-things-ideas division (which is the American College Testing Program's refinement of the Dictionary of Occupational Titles Classification system) and the Holland system. A number of exercises are presented to give the user practice with these classification systems; the user's responses are monitored for the purpose of providing more instruction if needed.

• Browsing Occupations makes use of the Holland classification system as an organizing structure by which the user can browse the world of work. The user may select titles from the list and receive a one-display description of the occupation's work setting and work tasks.

• Reviewing My Interests and Strengths is the Holland Self-Directed Search administered online. This instrument is a self-report of the user's career-related interests, experiences and competencies. The results of the instrument are interpreted to the user online.

• Making a List of Occupations to Explore provides the user with five ways to make a list of personal vocational options: 1) relating occupations to personal work values, 2) using the results of the Self-Directed Search (i.e., interests and competencies), 3) selecting titles from a list of occupations by the terminal, 4) combining selected occupational characteristics and/or 5) relating favorite school subjects to occupations.

• Getting Information about Occupations allows the user to get extensive information about the occupations on his/her list. By the voluntary selection of as many as twenty-one questions, the user may receive information about an occupation, its duties, potential benefits and limitations, educational requirements, future outlook and additional sources of information.

• Narrowing My List of Occupations assists the user in narrowing a list further so that he/she leaves the module with a first-choice occupation in mind and a limited number of others in priority order. This is achieved by the capability of asking for additional information about any occupation on the list and of analyzing the remaining occupations in light of identified work values, desired level of training, interests and competencies. The user is asked to remove occupations that are no longer of interest and to put the others in priority order.

Career Planning

• Exploring Specific Career Plans -- The user enters this module with one specific occupation in mind at a time. The system identifies for the user all of the possible paths of training to the selected occupations. The user may choose the path of entry that he/she wishes to explore in depth and branch to any of the following submodules of the system.

- Local Jobs provides an information section about how to seek a job. It also provides a search strategy for finding a job in the local area with the characteristics desired by the user. Use of the search strategy requires that each local site develop a local job data bank. Data might be obtained from the employment security job bank produced in each state.
- Financial Aid provides three capabilities: 1) definition of standard financial aid terms; 2) information about how to obtain financial aid, including an online assessment of student financial need and 3) information about available sources of financial aid.
- Apprenticeships provides two capabilities: 1) answers to common questions about apprenticeship programs, and 2) search strategies to find only occupations with apprenticeships, including identification of local companies that sponsor apprentices in the user's chosen occupation.
- Four-Year College Information and Search has two divisions: information about college admission and selection and a search strategy. The search strategy draws upon a data file of four-year colleges and universities in the nation, collected by the American College Testing Program. The strategy allows the user to combine characteristics in the following areas: approximately 200 majors; cost ranges; enrollment ranges; geographic locations; levels of competition for admission; student characteristics (class and test rank, sex and racial/ethnic membership); type of control, type and size of community; type of institution; type of school year calendar and a variety of special features. Combination of the student's selected variables produces a list of colleges that have the desired characteristics. Five displays of specific information are available about each college; entrance requirements; general information; characteristics of the freshman class; majors offered; cost and financial aid.

- Community and Junior Colleges provides two capabilities: answers to common questions about community and junior colleges and search strategies to find a college.
- Technical and Specialized Schools provides general information about technical and specialized schools and a search strategy to find those that will provide the training needed for entry into a specific occupation.
- Graduate and Professional Schools provides information about graduate and professional school education and a search through a national data file of graduate and professional schools. This search makes use of characteristics very similar to those used in the four-year college search.
- Continuing Education has two sections: general information about adult and continuing education and instruction on how to find adult and continuing education opportunities in the local area.
- Military Information and Search provides answers to typical questions about the military. Additionally, it provides a search strategy to find the specific program within any branch of the military that provides the training needed for entry into a specific civilian occupation. The sample problem contains the data file published in the Department of Defense Military-Civilian Occupational Source Book.
- Mid-Career Job Change (College/Adult only) was developed to help individuals who are involved in the process of changing careers in mid-life or entering the labor force for the first time in mid-life. It is designed to help the mid-career job changer by first identifying his/her individual needs and then drawing on the DISCOVER System's capabilities to meet those special needs.

DATA FILES:

(1) Occupations: 422 national occupations

(2) Four-year colleges: 1800 nationwide

(3) Two-year colleges: 1400 nationwide

(4) Technical and specialized schools: 11000 nationwide

(5) Apprenticeship: informational script as well as references to particular apprenticeable occupations. State/local programs would have to be added.

(6) Military training programs: informational script as well as 420 occupations for which military training is available and there is a civilian equivalent.

(7) Graduate and professional schools: 500 nationwide

GEOGRAPHIC SPECIFICITY: Occupational, two-year and four-year college, technical/specialized school and graduate/professional school information is national. The technical and specialized school file can be cut from nationwide to state schools.

Specific state or local apprenticeship programs can be added, as well as daily job listings from the state employment service.

CLASSIFICATION SYSTEM UTILIZED: DOT for civilian and military occupations

OTHER COMMENTS:

- DISCOVER is used in several large installations in Florida. The two largest are in Orlando and Miami. The Orlando area has about 100 terminals and the Miami area has about 200 terminals. Both installations have plans for expansion.

- Vermont has recently chosen DISCOVER to be its state CIDS.

- The flexibility offered by the FrameBuilder author language is unique. Tailored modules could be developed for particular populations to meet their specific needs. Additional files can also be generated.

- The author language capability also allows adoption of SOC codes. This process is already underway at IBM and the DISCOVER Foundation.

- A complementary paper system is being developed for DISCOVER.

COST: DISCOVER is available from either the IBM Corporation or DISCOVER Foundation. These costs differ slightly when acquiring both the Secondary and College/Adult versions.

- IBM — charges $1000 per month for a single version and $1250 per month for both versions for a particular mainframe. Each is on a two-year paid-up lease basis, that is, after 24 consecutive monthly payments, the licensee has a perpetual right to use DISCOVER on that mainframe.

- DISCOVER Foundation, Inc. -- charges $1000 per month for both versions, also on a two-year paid-up lease basis. Updates are free during the lease period (two years).

- Whether IBM or the Foundation is the supplier, data base updates are available through the Foundation for $1500 per year.

- Staff training is available from the DISCOVER Foundation.

HARDWARE AND SOFTWARE:

Hardware: DISCOVER can be run on the IBM 370 series.

Software: DISCOVER operates as a task under CICS/VS in an OS/VS or DOS/VS environment. To facilitate conversion to other teleprocessing monitors, all CICS-dependent code has been restricted to two COBOL programs and one ASSEMBLER subprogram. DISCOVER is a system of hierarchically structured COBOL programs.

The DISCOVER system currently consists of 19 programs, of which nine are used online. Online programs total approximately 400K bytes. Each terminal using DISCOVER requires 8K of permanent storage and approximately 10K of transitory storage.

Terminals: DISCOVER requires 3277 model 2 (1920 - character display) or equivalent CRTs with light pen and EBCDIC typewriter keyboard. IBM 3276 (stand-alone) or 3278 (additional) terminals are also appropriate.

DISCOVER does not require use of a printer. If a supplementary printer is to be used, it should be in the 3284/3286/3287/3288 series.

3.3.7 ECES

NAME: Educational and Career Exploration System (ECES IV)

DEVELOPED/MARKETED BY:
Genesee Intermediate School District
Vocational Education and Career Development
2413 West Maple Avenue
Flint, MI 48507

DESIGN/FUNCTION: ECES is an interactive guidance system designed to assist students in career exploration and development. Students go through six modules while using ECES: awareness, search, explore, experience, plan, placement. The counselor and monitor prepare the students for their sessions on the ECES terminal. A color microfiche reader is used in conjunction with the computer terminal. Furthermore, the ECES staff stresses the value of complementary career counseling, so that ECES is used in conjunction with MOIS, the Michigan Occupational Information System.

The Awareness module helps students to become aware of who they are and what they want in life. During this step, the students make self-estimates of their interests, educational aspirations, work values, personal values and learning abilities. This information is used in helping them understand how different career options can meet their needs. Their understanding of different occupational groups is assessed in this step. Also a decision-making overview is presented to the students. This step is primarily off-line from the computer and utilizes a color filmstrip or microfiche presentation which may be used in a group guidance or classroom setting.

The second module is a search strategy which helps students focus on preferred occupational options. Students focus on these options by using their interest test scores, self-estimates of their interests, the salary level they would want, the high school courses they like, the amount of education they plan to complete, and the kind of work activities they prefer. The interest inventory utilized in this search strategy is the Ohio Vocational Interest Survey (OVIS). Their search strategy suggests occupations to explore based on the criteria listed above.

In the Explore module, students become aware of the many career alternatives from which they may choose. They do this by exploring occupations, educational programs, vocational-technical schools, colleges and universities. In exploring occupations, students see on-the-job scenes, occupational descriptions and cartoon quizzes on specific job characteristics, which are displayed in color. Students can find out what educational preparation is required to enter specific occupations, such as high school courses, or educational programs found at the trade-technical school level, the junior or community college level, or the four-year college or university level.

The students experience six phases during the next module, Experience. First, the students learn how to make a decision about their internships which could be their "Day-on-the-Job" and/or "Exploring Career Program" options. Second, they learn how to write a letter of application for their internship experience. Third, they learn how to interview for their internship. Fourth, they arrange for and have their internship experience. Fifth, they rate their internship experience to help decide if their tentative occupational choices still meet their requirements. Sixth, the students view assessments of themselves as rated by their teachers, employers and themselves.

During the fifth module, Plan, the students learn how to make several different types of decisions. They learn how to use values and favorability scales to decide between two options in seven content areas. These content areas relate to choices for occupations, educational programs, levels of education, schools and colleges, high school courses, college courses and personal options. These decision-making skills may be taught with the computer terminal and microfiche reader or in group guidance and classroom settings utilizing a filmstrip presentation. Also, this step includes a career plan verification process which integrates students' plans in the occupational, educational programs, schools or colleges and high school course areas. They work with their counselors, teachers and parents to map out programs which are needed to develop the skills required to give them a start on their career plans.

The last module, Placement, involves students and employers. Students may access information about available job openings in the employer placement component. Employers may access information about available students looking for jobs in the student placement component. The Manpower, Occupational and Career Information Clearinghouse (MOCIC) component may be accessed directly to obtain current manpower, occupational and career information needed in career exploration, decision-making, planning and placement.

DATA FILES:

(1) Occupations: which illustrates 400 occupations on color microfiche with 10,000 frames reviewing topics of occupational information. It includes more than 1,400 on-the-job pictures showing real work situations, together with 1,160 situations which people in those occupations are trying to solve.

(2) Educational Programs: which describe over 300 educational programs that range from African Area Studies to Zoology. This section tells students which vocational-technical school or college courses are required to qualify for a particular occupation. More than 4,500 courses are thus described.

(3) Charts: which help students relate their own interests and ambitions to their explorations. Using this section, students request summaries and analyses of each occupation or educational program investigated. Other charts offer information helpful to students in their career planning.

(4) Vocational-Technical School and College Finder: which enables students to search for vocational and technical schools located in Michigan, as well as junior or community colleges and 4-year colleges and universities located throughout the U.S., that offer educational programs or fields of interest they are considering. Information on size, geographic location, admissions requirements, tuition, religious affiliation (if any), housing and financial aids on more than 3,000 schools and colleges can be obtained.

(5) Manpower, Occupational and Career Information Clearinghouse (MOCIC): which provides comprehensive manpower, occupational and career information that is updated on a daily basis. This information is linked directly to the other files described above. It provides current daily information updates to supplement existing information available in these file libraries.

GEOGRAPHIC SPECIFICITY: National college information and state-level vocation-technical school information.

COST: ECES IV is currently unavailable for distribution.

HARDWARE AND SOFTWARE: ECES IV is currently run on an IBM 370/145 mainframe, with IBM 3270-compatible terminals. It does not require such a large mainframe and an IBM 360/25 or 370/125 can be used. The operating system is DOS/VS with CICS. ECES is written in COBOL and Assembler. A microfiche reader is also required.

3.3.8 EXPLORE

NAME: EXPLORE

DEVELOPED BY: Dr. JoAnn Harris-Bowlsbey, Mr. Charles Maloy (guidance design, text, data files) and Dr. Edwin Sasaki (technical design and programming)

MARKETED BY: Towson State University
Towson, Maryland 21204

DESIGN/FUNCTION: EXPLORE is a career guidance and information system based on the assumption that individuals need at least the following in order to make satisfying vocational choices:

- self-information, especially about interests, abilities/skills and work-related values;
- understanding of the organization of the world of work;
- good linkages between elements of self-information and specific occupations in order to develop a list of personal occupational alternatives;
- accurate information about occupations;
- accurate information about educational/vocational training programs and the institutions in which they are available.

The content of EXPLORE is divided into eight modules:

- Exploring Occupations by Understanding the World of Work -- The two primary objectives of the module are to teach an organizational structure for the world of work and to allow the user to identify occupations for exploration by making use of this structure. The interactive dialog teaches the World of Work Map with the assistance of a poster by the terminal. Users may identify occupations in the EXPLORE data file by the three concepts of the map (i.e., work dimension--data, people, things and/or ideas--by region number and/or by job family).
- Exploring Occupations by Assessing Work Values -- This module seeks to teach nine specific work-related values, to assist the user to rate the level of personal importance of each and to identify occupations from the EXPLORE file which provide

the combination of values selected by the user. The work values developed by Dr. Martin Katz of Educational Testing Service are used: high income, prestige, independence, leadership, variety, security, leisure, helping others and early entry.

- Exploring Occupations by Assessing Interests -- UNIACT IV, a 60-item interest inventory developed by the American College Testing Program is administered at the terminal. The computer then scores and interprets it to users. This instrument plots an individual into the World of Work Map. Specific occupations which are located in the region of an individual's score, and in closely related regions on the Map, are identified for exploration.

- Exploring Occupations by Assessing Skills -- Since each of the four dimensions of the World of Work Map (e.g., working with data, with people, with ideas and/or things) requires different skills, users are asked to do a self-assessment of skills in each of these four dimensions. Based upon the online assessment, the computer identifies specific occupations for exploration at the educational level chosen.

- Exploring Occupations by Examining Job Characteristics -- This part of the system allows users to identify job characteristics which are of personal importance and to find occupations which combine them at the level desired. Work characteristics used in this module are employment outlook, type of work setting, type of work tasks, work hours, level of responsibility, entry level, potential income, travel and physical danger.

- Exploring Occupations related to Majors and Programs of Study -- This module allows the user to enter the code number of an occupation in the file and to identify a needed or desired program of study or to enter the code number for a program of study and identify occupations which are related.

- Exploring and Selecting Personal Options -- This module pulls together and displays for the user all occupational titles which have been identified by any of the strategies used in the previous six modules. Users may then ask for extensive occupational information. The EXPLORE system contains an occupational data file of more than 400 descriptions which are provided in an interactive mode by asking any or all of 21 questions. This file provides a good balance across educational entry levels, and is constantly maintained.

- Exploring Ways to Enter Selected Occupations -- This module assists the user to make an action plan for entering tentatively selected occupations. The user enters the code number of a given occupation and is informed about the available paths of training for entry. Search strategies are provided through a national file of four-year colleges and a local file of technical and specialized schools.

Users may choose to use the EXPLORE system in two ways: as a systematic career guidance experience or as a tool for direct access to data files. In the first approach, users would sign on and create a personalized record; then use one or more of the first six modules in order to create a list of occupational alternatives; next retrieve extensive information about identified occupational options and finally, identify educational institutions where training for these occupations can be secured. In the second approach, users need not sign on and create a personalized record, but may go directly to the data files of information about occupations and educational institutions and/or to the college search strategy.

Use of the computer for guidance functions has been criticized, but the philosophy of the developers of EXPLORE is that the computer can be used effectively for: storage and maintenance of an individual user record to provide monitoring and review; on-line administration, scoring and interpretation of interest and skills assessment instruments; search of extensive occupational and educational data files by use of a variety of variables in combination and display of extensive data about occupational and educational options.

DATA FILES:

(1) Occupational
(2) Four-year colleges
(3) State community/junior college file
(4) State technical school file

GEOGRAPHIC SPECIFICITY: The national data files, occupations and four-year colleges, are being provided by DISCOVER Foundation, Inc. The state files for community/junior colleges and technical schools must be developed locally.

CLASSIFICATION SYSTEM UTILIZED: DOT

OTHER COMMENTS:

- A complementary paper system is being developed for EXPLORE.
- The EXPLORE system is designed for a distributed network, rather than for a single, large mainframe.

COST: Acquiring EXPLORE would cost between $7000 to $8000 per CPU. Annual costs would be about $4000 for maintenance and updating. These costs are approximate and tentative.

HARDWARE AND SOFTWARE: The EXPLORE software is programmed in COBOL and is available in versions which run on a Univac 1100 series machine and on a Hewlett Packard 3000. The system will operate on any asynchronous cathode ray tube terminal with screen and cursor control, utilizing regular voice grade phone lines. A printer may be provided with the terminal in order to produce paper copy for the user.

3.3.9 GIS

NAME: The Guidance Information System (GIS III)

CREATED BY: Dr. David Tiedeman

DEVELOPED/MARKETED BY:
TimeShare Corporation
630 Oakwood Avenue
West Hartford, CT 06110

DESIGN/FUNCTION: GIS is an interactive computer-based system for retrieval of career information. It is designed to help students, counselors, administrators, handicapped individuals, veterans, CETA clients and others involved in career planning.

The user may access information via a direct approach for specific data or a structured search for exploring occupational choice through a series of accessing strategies.

To gain access to a file, the user types the four-letter abbreviation for the desired file in response to the prompt "Which File?". "Q" (quit) followed by a file code may be typed to exit a file and move on to another.

Direct access to information is accomplished by the command "P" (print) followed by an occupational or college code. This will yield a 150-word description. "I" (itemize) followed by a code will give a complete listing of all the characteristics true for the occupation or college. A from-to option is also available for the "I" command, which allows a listing of characteristics within a particular numerical range to be printed. Itemization is not supported for Armed Services occupations (ASOC).

The structured search can be done in any file except ASOC. Various commands are available for the search:

- A (add) followed by a characteristic code tells the computer to include all occupations or colleges which have that characteristic.

- S (subtract) followed by a characteristic code tells the computer to leave out the occupations or colleges which have that characteristic.

- E (either/or) followed by two or more characteristic codes separated by slashes (/) tells the computer to include the occupations or colleges which have at least one of the specified characteristics.

- D (delete) followed by a characteristic code erases the specified characteristic from the user's list of choices.

- L (list) prints all the characteristics entered thus far in the search.

Once the user has finished with the search commands, "N" (names) will print the occupation titles or college names if the list has fewer than 25 occupations or colleges. A longer list can be printed at some installations using the "U" (upper limit) command. The "C" (check) command followed by an occupational or college code allows the user to find out why a particular occupation or college did not appear on his/her list. Further information can be obtained by using the "P" and "I" commands previously discussed. Use of these commands without a specific occupational or college code will print or itemize information for all the occupations or colleges on the user's list.

A complete list of commands and instructions for their use is given in the GIS Guide. All characteristic codes pertinent to occupations and colleges are listed here as well. A complete list of occupational and college codes, needed for direct access, is given in the GIS Resource Kit.

DATA FILES:

(1) Occupational information (OCCU)
(2) Two-year college information (COL 2)
(3) Four-year college information (COL 4)
(4) Graduate school information (GRAD)
(5) Financial aids information (AIDS)
(6) Armed Services information (ASOC)

GEOGRAPHIC SPECIFICITY: National career information. Local files developed by user's specifications (agreed upon financial agreement) includes locally relevant information about occupations, vocational training schools and sources of financial assistance. TimeShare and contracting agencies have shared responsibility for developing state and local files. One arrangement is for the agency to collect the data for the local files and for TimeShare to assume responsibility for file and data collection instrument design, data entry and proofreading. A list of possible local files and 1980 prices is included at the end of this system description.

COSTS: Excerpts from 1980 TSC literature

"The basic GIS Options Costs are as follows:

a. Annual license fee for national GIS.
b. One-time state file development fee.
c. Annual update fee for state file(s).
d. User guides and other support materials requested.

"The annual license fee for the national GIS is based on the number of sites using the system. A statewide license can be acquired which allows for unlimited use of GIS in the state.

"The development and update fees vary for the different types of state files. The cost is directly related to the size of the data base for the file and the allocation of TSC and client responsibilities. The price quoted for each file includes a specified amount of onsite consultative time at no additional cost. Costs for specific file options are available upon request. Prices are quoted for 90 days."

GIS

Class	Fee	Schools	New Contract Training Days
IA	2600	1	1
IB	3600	2-3	1
IC	4400	1(large mainframes IBM, etc.)	
II	4800	4-5	1
III	7600	6-10	2
IV	10900	11-16	2
V	15300	17-32	2
VI	Negotiated		

Class IA and IB licenses are limited to HP, DEC, Prime, and TSC hardware. Option C is the minimum license fee for all other systems.

HARDWARE AND SOFTWARE: Excerpt from TSC literature

Computer	Operating System	Language
HP 2000 C		BASIC
HP 2000 F		BASIC
HP 2000 (Access)		BASIC
HP 3000	MPE III	BASIC & SPL
TSC 200		BASIC
TSC 300		BASIC
PDP-11	RSTS 6C	BASIC+
DEC 10	TOPS 10	FORTRAN IV
DEC 20	TOPS 20	FORTRAN IV
BURROUGHS	CANDE	FORTRAN
CDC	NOS	FORTRAN
HONEYWELL	GCOS	FORTRAN
IBM 370	DOS/OS Course Writer III	BASIC
IBM	DOS/VS CICS/VS	ASSEMBLER
PRIME	PRIMOS	FORTRAN
UNIVAC	VS/9	FORTRAN
XEROX	CP-V	FORTRAN

GIS III

File	Development Cost	1980 Update Cost	Consulting Time Included
State Occupations			
250 (225 National & 25 Local)	$22,300	$16,300	2 days
Voc/Tech Schools			
350	13,400	6,800	1 day
600	17,800	10,900	
State Financial Aids			
350	17,500	11,100	1 day
Local Business			
350	12,100	5,800	1 day
Apprenticeship			
150	11,000	3,000	1 day
CETA			
150	9,400	3,300	1 day
Women's Services			
300	11,000	5,000	1 day
500	13,800	7,700	1 day
Handicapped Services			
350	9,500	4,200	1 day
600	14,000	6,000	

Note:
- Special quotes are required for deviation from these specifications.
- Price quotes will be honored for 90 days.
- Support materials, i.e., state user guides, priced separately.
- All prices listed above apply for any prospect other than prospects appearing on the March prospect list. These prices were quoted in mid-1980.
- Minimum order $20,000.

3.3.10 SCAD

NAME: Student Career Assessment and Determination Project (SCAD)

DEVELOPED/MARKETED BY:
Evaluation Techniques Consortium
9950 Topanga Canyon Blvd., Suite 79
Chatsworth, CA 91311
(213) 882-6622

DESIGN/FUNCTION: The SCAD Project was developed out of the need to provide vocational guidance and counseling sessions with a readily accessible method of assisting students to understand vocational opportunities in the Los Angeles City Unified School District (LACUSD). Its initial concept was to provide computerized access following from the administration by paper and pencil of the already developed Career Planning Inventory (CPI). The student profile created out of the CPI was used as the basic tool for a student to access SCAD.

The SCAD System was designed for terminal units linked to the mainline LACUSD computer to be placed in individual school career centers. The units provided for both a CRT and an output printer. Both counselors and aides hired to assist the counselors were trained in the use of the terminal and in the applications basic to the SCAD System.

Essentially what SCAD is able to accomplish when operational is the following:

(1) A student can seek information on any job title listed on his/her CPI interest inventory profile;

(2) The information available to the student includes actual course descriptions of training offered throughout the LACUSD, training outcomes from those areas expressed in Dictionary of Occupational Titles (DOT) terms and structured as to entry-level outcomes, advanced-level outcomes and career lattice opportunities, the most recent supply/demand figures provided by the Employment Development Department and processed through the California Occupational Information System (COIS), and the locations where such training is available through the LACUSD;

(3) Also provided in the system is a set of cross-relationships allowing students to explore related jobs beyond that which is available from their Career Interest Inventory Profile.

The SCAD System is not complete. Future planning for continued development will require additional state and local funding for the expansion of the data base on training possibilities to include the Los Angeles Community College System as well as CETA programs run by the County of Los Angeles. It is also planned that the Career Planning Inventory (CPI) will be made interactive rather than paper and pencil as part of the total computer system. Also added to SCAD would be the adult version of the CPI which has been developed by Dr. Art Smith of the San Bernardino County Schools.

Not available on SCAD output at this time but capable of being added are the complete job descriptions from the 4th Edition of the DOT (worker trait information is already available through the interactive SCAD Program).

Still another use for SCAD to be explored is its potential usefulness as a planning tool for instruction wherein a numerical count of the student searches in using the system can be analyzed by computer in planning course development and modification for future scheduling.

DATA FILES:

(1) Course data
(2) Dictionary of Occupational Titles data
(3) Supply/Demand data
(4) Additional locations for courses
(5) Additional courses in this occupational area

GEOGRAPHIC SPECIFICITY: SCAD is programmed for use of local information tailored for the specific user.

CLASSIFICATION SYSTEMS UTILIZED: DOT (4th Edition), USOE

OTHER COMMENTS:

- It appears that the Los Angeles Unified School District will not continue to operate SCAD after the 1979-80 school year, because of budget limitations.

COST: Excerpt of letter of July 2, 1980 from Evaluation Techniques Consortium:

"An actual figure for the costs involved in acquiring SCAD as a statewide system was developed for a single large urban school district, the Los Angeles City Unified School District. It can be designed for a statewide application and costs can be provided if we are able to obtain information on the scope of the statewide application. Specifically, SCAD focuses upon local training information written in D.O.T. terms. The amount of this information would be critical in defining costs. As to support services, any contract developed for implementation of a statewide system would include a maintenance component."

HARDWARE AND SOFTWARE: The computer hardware required for SCAD is a minicomputer with direct access capability. SCAD is written in COBOL using ISAM.

3.3.11 SEARCH

NAME: System Exploration and Research for Career Help (SEARCH)

DEVELOPED/MARKETED BY:
State of Oregon Employment Division
Department of Human Resources
875 Union Street, N.E.
Salem, OR 97311

DESIGN/FUNCTION: In 1970 a cooperative effort was undertaken by several Oregon Education Service Districts and the State Employment Division to develop a new counseling approach to career exploration and decision-making.

The basic goal of SEARCH is to provide a counseling-career guidance system for clients leading to training and/or a job. This counseling system embodies as its major elements: highly refined techniques for inventorying occupational interests and aptitudes; a sequence of self-evaluation exercises related to the world of work and a comprehensive method of occupational exploration. The system has also been adapted for student use.

The computerized portion of SEARCH allows a counselor to concurrently evaluate a client's interests and aptitudes by relating Worker Trait Groups (WTG), GATB scores and the U.S. Employment Service Interest Check List (ICL). Thus, the system is able to retrieve career information through exploration of personal interests, aptitudes and career opportunities.

SEARCH is in the process of becoming totally computerized. For the present, the GATB and ICL printout is used in conjunction with printed materials, both interpretive and descriptive. Once the process is complete, the system will have potential for use in CETA and other human resource agencies, as well as schools and colleges.

DATA FILES: Data files contain information used by the Employment Service and include:

(1) Occupational descriptions based on WTG

(2) Related occupations

(3) Training requirements and locations

(4) Economic information-employment outlook and earnings

(5) Special requirements to enter occupations

GEOGRAPHIC SPECIFICITY:

National/State: Occupational information
Preparation information

State/Local: Education and training; current employment and outlook

CLASSIFICATION SYSTEMS UTILIZED: OES, USOE, DOT and CENSUS

COSTS: Not indicated

HARDWARE AND SOFTWARE: None indicated

3.3.12 SIGI

NAME: System of Interactive Guidance and Information (SIGI)

DEVELOPED BY: Dr. Martin R. Katz

MARKETED BY: Educational Testing Service
Princeton, New Jersey 08541

DESIGN/FUNCTION: The following description of SIGI is taken from Shatkin, Laurence. Computer-assisted guidance: Descriptions of systems, Princeton, NJ: Educational Testing Service, 1980.

SIGI addresses the following components of the guidance process:

- appraisal--of importance of occupational values; of type or level of satisfaction for these values; of risk of failure to gain entry to a selected occupation; of probabilities of success in courses relevant to preparation for a selected occupation

- information about options--occupational information; sources of further information; information about content and difficulty of courses relevant to preparation for selected occupations (local option)

- planning--best entry route to occupations; recommended programs at user's college (local option); other institutions of education or training (local option); sources of financial aid (local option)

- decision-making--by means of overall desirability in terms of satisfaction of the user's values and probabilities of completing all steps to entry.

A first-time user conducts structured search first, then direct access; subsequently, the user can conduct either or both. Accessing commands are entered in response to a prompt given by the computer and consist of selecting from options displayed.

Structured search. In Locate, the user selects five values and specifies the minimum amount (or category of interest field) he/she will settle for. The computer responds by displaying a list of occupations which meet or exceed these specifications. The user may ask why an occupation did not appear on the list; the computer will identify which value specification(s) ruled out that occupation. The user may also change specifications or select other values to generate a new list.

Direct access. In Compare, the user selects three occupations and selects a set of up to five specific questions to ask about them. The computer displays the answers for all three occupations simultaneously, in parallel rows. After each set of questions, the user may select another set out of a total of 28 or may change one or more of the occupations being compared.

In Planning, the user specifies an occupation and is shown a display outlining the best path(s) of education or training for entry into the occupation. The more detailed educational and training information in a tailored Planning subsystem (a local option) is accessed the same way. The user does not have to specify an occupation to access the financial aid information.

In Prediction (a local option), the user specifies a college program or major and is told the name of the key course in the program. The computer then has the user give test scores (if any), information about past performance, self-ratings on various factors, and his/her estimate of final grade. The self-ratings and estimates are based on information provided about the content and grade distribution of the course. The computer responds with the user's "chances in 100" of getting grades of A or B, C, and below C in the course.

Search rules. Compare allows any set of five of the ten possible values to be used in a structured search. The computer follows a "greater than or equal to" rule . Thus, when a user specifies an average amount of security, the resulting list will not exclude those occupations which afford a high amount of security. The exception to this search rule is "interest field," which applies an "equal to" rule; the list will include only those occupations which involve activities related to the specified interest field.

Decision-making rules. In the Values subsystem, the user assigns weights to each of the ten values and plays a game which dramatizes value choices. The user then reweights values, distributing 40 points among the ten values.

In Strategy, the user may reweight these values again. Then for each value the computer displays the numerical rating of each occupation in the set of three selected by the user. The rating indicates the amount of opportunity provided by the occupation to satisfy the value in question. The weight for each value (showing its importance to the user) is multiplied by the rating (the degree of opportunity offered by each occupation). The sum of these products for each occupation provides an index of the occupation's overall desirability for that user.

The user then considers the steps necessary for entry to each occupation and estimates the probability of successful entry. A local option, the Prediction subsystem, aids the user in this estimating task by computing the user's "chances in 100" of getting a given mark in a key course needed to prepare for the occupation.

The user finally evaluates occupational choices in the light of risks (probability of successful entry) and rewards (desirability).

DATA FILES:

(1) Compare--national occupational information (181 occupations)

(2) Prediction—probabilities of various grades in key courses relevant to preparation for selected occupations (local option)

(3) Planning--best entry route to occupations; recommended programs at user's college (local option); other institutions of education and training (local option); sources of financial aid (local option)

GEOGRAPHIC SPECIFICITY: The occupations file contains national information, but significant regional differences in occupational characteristics are incorporated. The other two files on prediction and planning contain strictly local information.

CLASSIFICATION SYSTEMS UTILIZED: Not based on taxonomy.

OTHER COMMENTS:

- An adult version of SIGI is being developed.

COST:

- The basic SIGI system, updated annually, is available for $2000 per year for up to four local terminals, plus $500 for each additional terminal per site. A special fee schedule can be negotiated for large or regional consortia represented by a single agency or institution. These fees include a current occupational data base updated annually, manuals with comprehensive instructions for installation and operation and copies of the counselor's handbook.
- If a college wants an institutionally specific version of SIGI, the prediction and planning data bases unique to the institution will require cooperative development at additional cost.

HARDWARE AND SOFTWARE: The DEC PDP-11 Series with RSTS/E is the standard computer for running SIGI, which is written in BASIC+. Some colleges have converted SIGI to run on different computers, including PRIME, CDC Cyber, UNIVAC and XEROX and can provide the software on a cost basis. New conversions are also permitted. In either case, a basic SIGI license must first be obtained.

3.3.13 VIEW

NAME: Vital Information for Education and Work (VIEW)

DEVELOPED/MARKETED BY: Center for Career Development Services
Florida Department of Education
Division of Vocational Education
Tallahassee, FL 32301
(904) 488-0400
(800) 342-9271

DESIGN/FUNCTION: VIEW, unlike the other systems described in this section, is not a unique or single product. Rather, the VIEW name represents a microfilm/microfiche-based career information delivery system. There is no single vendor; 35 states are using VIEW systems. Some of these states would be willing to help other states develop their own VIEW systems and have formed a consortium to share information and enhancements. This description is based on the Florida VIEW system.

VIEW microfiche aperture cards have to be placed on a microfiche reader or reader/printer to be used. Each card contains information relevant to an occupation title listed on the upper left hand corner of each card.

The major goal of VIEW is to help students find answers about careers in Florida. The Career and Training Locator cards of Florida VIEW are meant to expand choices through up-to-date, accurate information. VIEW desires to increase individual options and to help find answers to such questions as, "Where am I going?" and "How do I get there?"

As already mentioned, there are two basic decks of aperture cards. The Career Deck contains information on some 500 Florida careers:

- The Job —
gives the career title and a very short job descriptor

- Job Characteristics --
indicates what a person should have in the way of personal traits, aptitudes and physical traits

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- Preparation and Training --
tells what level most employees have when entering this occupation

- Prospects and Opportunities --
some comments about job outlook and advancement in Florida

- Economic Returns --
gives a graphic chart on the range of earnings for each of five geographic regions in the state

- More About This Job --
gives an outline of job duties, working conditions, hours of work and usual fringe benefits

- Where to Find More Information --
associations and business/industry names and addresses

- Related Jobs --
a listing of closely related available VIEW scripts for further investigation.

The Training Locator Deck is the second basic deck of cards. These contain the following information:

- Training Locator --
gives reader the name of every public school in Florida that offers a program in this career field, the title of each program, the award upon completion, the area in which the individual training sites are located

- Course of Study and Where to Find More Information --
a sample course of study is listed for each program

- Location Maps --
graphic display showing the location of the schools throughout Florida which are listed as training sites.

There is also a set of Armed Services VIEW cards and a Contact Person List for almost all of the career titles. Two books are available: Careerbook, the Florida VIEW student manual and Pre-VIEW, intended for counselor pre-service education programs.

DATA FILES:

(1) Careers
(2) Training Locator
(3) Armed Services
(4) Contact Persons

GEOGRAPHIC SPECIFICITY: State specific data only.

OTHER COMMENTS:

- The Florida staff is revising VIEW to be compatible with CHOICES, their computerized career information delivery system.

COST:

- Approximately $100 per set of VIEW decks, the Armed Services Deck and Contact Person List is free to VIEW subscribors.

- If microfiche reader/printers are used, about $50 to $250 per year will be spent for paper and fluid which is between five and ten cents per page.

- A microfiche reader will cost between $200 and $300, while a reader/printer will cost between $1000 and $2000.

HARDWARE AND SOFTWARE: A microfiche reader or reader/printer with the proper lens size is required.

3.3.14 VIP

NAME: Vocational Information Program (VIP)

DEVELOPED BY: Mr. John Cripe

MARKETED BY: Joliet Junior College
Joliet, Illinois 60436

DESIGN/FUNCTION: VIP originally began as a batch process version of CVIS. Online usage is available, depending on the particular computer installation. In the batch mode, users fill out request forms, which are processed daily and returned within a few days. The request forms are available in the classroom or counseling office and the VIP staff recommend a counseling session before filling out a request form for the first time.

The VIP System now consists of ten modules:

- Vocational Interest Testing, where students respond to the U.S. Employment Service Interest Check List. Two hundred ten activities are marked and then evaluated by the computer. A three-part report is presented to the user. A correlation listing between ICL interest areas and VIP careers is also provided.

- Careers, which contain 400 career resumes taken from the latest Occupational Outlook Handbook. They contain information as to job duties, training requirements, working conditions, general employment outlook, general earning levels and where to write for additional information.

- Military Jobs, which contain 400 job resumes from the latest Military/Civilian Occupational Source Book. Military job titles are referred to, as much as possible, by their civilian counterparts.

- Job Opening Forecasts contain information on projected national job openings through 1985 as provided by the Occupational Outlook Handbook in Brief. The forecasts contain information as to the estimated total employment for each job in the file and the expected annual openings through 1985.

- High School Subjects Worksheets contain information on the courses required for and related to occupations in the Careers module. A worksheet is printed for use by the student and counselor. This list of standard high school subjects may be altered by the counselor to reflect additional subjects available at the particular high school.

- High School Information may be developed by particular high schools to explain its policies, procedures and courses. Topics may describe activities, departments or administrative requirements and may be used as part of the general orientation program for new students.

- Local Jobs contains information on the type of jobs maintained by local companies. The employer survey provides extensive information on each employer.

- Financial Aids information is also maintained. This includes information on specific scholarships and grants, as well as advice on searching for aid sources.

- Junior College module contains information on various topics, as well as detailed descriptions of courses, for local community colleges.

- College Search module offers the student information on any of 2600 colleges in the United States. Students can request a general search of colleges based on six characteristics or can request information on specific colleges.

DATA FILES:

(1) Careers, updated every two years
(2) Military Jobs, updated every two years
(3) Job Openings Forecast
(4) High School Subjects Worksheets
(5) High School Information
(6) Local Jobs
(7) Financial Aids
(8) Junior College
(9) College Search

GEOGRAPHIC SPECIFICITY: The Careers and College files contain national data, other files are local.

OTHER COMMENTS:

- VIP has developed mini-manuals to assist classroom teachers. These permit VIP to be used directly in the classroom as part of the curriculum.

COST:

- $1 per user annually. This fee is paid by the school. It permits the user unlimited access during the school year. This fee also includes manuals, request forms and inservice staff training and orientation.

- $5,775 per computer operating site, if program is purchased.
- The cost of the local employer survey may be from $40 to $50 per employer in the final data base.

HARDWARE AND SOFTWARE: VIP is written in COBOL and runs on various computer mainframes, including NCR, PRIME, IBM, Honeywell and Burroughs. Input can be via local CRT with printer output, remote terminal/printer with remote printer output or local card input with printer output.

3.3.15 VOCOMP

NAME: Computerized Assisted Vocational Rehabilitation Counseling Technique (VOCOMP)

DEVELOPED/MARKETED BY: Gary and Marjorie Golter
Innovative Software
19824 Ventura Blvd., Suite 102
Woodland Hills, CA 91364
(213) 884-5581

DESIGN/FUNCTION: VOCOMP is a computer-based information system by which an insurance company, self-insurance administrator, vendor or other appropriate user can match disabled persons with jobs that fit their skills, level of formal education and personal desires. VOCOMP is particularly useful in managing worker's compensation, disability and unemployment insurance claim matters and has other uses.

The data base includes detailed physical and intellectual skills required for 12,000 different jobs; this data was accumulated from recognized source material. Additionally, the data base includes, for the states of California, New York and Hawaii, local job market trends, salary data, information concerning courses offered by local educational institutions and addresses and phone numbers of those institutions.

In VOCOMP's most complete use, a counselor completes a data sheet with information about the disabled person's physical skills, work history, education history, intellectual capacity, salary requirements, results of mental and physical tests, likes and dislikes, vocational desires, locale and various other information that is relevant. The information is then fed into the computer and a printout is produced showing jobs that are available in the disabled person's area that best match the data fed into the machine, what, if any, additional training might be needed, where in his area he might get such help, salary data, etc. The computer also shows how its suggestions match up against the worker's suggestions. This printout then can be used to assess whether the worker is reemployable and how difficult it will be to find him/her a job.

VOCOMP can be used with a lesser amount of data. In its transferable skills mode, the computer can take limited information concerning the disabled person's previous job and the disability and make suggestions for jobs that might be available in his/her area based on skills that can be transferred from one type to another.

DATA FILES:

(1) Occupational Data -- physical and intellectual skills required for 1200 different jobs

(2) Job Market Trends

(3) Salary Data

(4) Courses offered by local educational institutions -- including addresses and phone numbers of the institutions

GEOGRAPHIC SPECIFICITY: Occupational data is national, but job market trends, salary data and course information is available for California, New York and Hawaii only.

CLASSIFICATION SYSTEMS UTILIZED: DOT and WTGs, which have been further refined for greater specificity.

OTHER COMMENTS:

- VOCOMP can be used to audit the efficiency of persons providing services to clients on behalf of insurance companies, self-insurance administrators and others. One carrier has used VOCOMP for this purpose.
- Innovative Software reports better success with use of complete client information rather than just information on the disabled person's previous job and disability.

COST:

- $30000 per year lease; optional lease arrangements are available. that have lower base price with additional charges calculated annually on case processing volume.
- $60000 one-time lease
- $5000 annually to maintain local databank
- total system support through Chicago-based affiliate

HARDWARE AND SOFTWARE: VOCOMP is written in COBOL and requires 100K bytes of main memory. It can run on an IBM 370 or be transported to any major mainframe.

3.4 Configuration Examples

3.4.1 Overview of Computer Networks

Computers can communicate with users located great distances away as well as with each other. A collection of computers and terminals connected together by a communications system is called a network. Networks can supply users with large amounts of data or computer power, reduce costs to user agencies via sharing of resources and provide increased reliability by building greater redundancy and backup power. Networks can be classified in a number of ways. Some possible configurations are described in this section.

3.4.1.1 Brief definitions of required hardware.

computer	-- large mainframes (e.g., IBM, CDC, Burroughs) to minicomputer (e.g., DEC, HP)
terminal	-- online: CRT, CRT/printer, hardcopy terminal batch: card reader/printer
modem	-- for interfacing between the telephone network and the computer or terminal
concentrator	-- for connecting several dial-up phone lines with a high-grade, high-traffic line
communications computer	-- minicomputer that interfaces with the network and/or the host mainframe. It is similar to a concentrator and performs data handling and preliminary processing functions

3.4.1.2 Telecommunication-based systems.

Centralized Network

In this arrangement, the programs are operated on one or more large computers in a centralized location. Users dial in by phone or leased line to access the computer. Users need only a terminal. Large computers, such as IBM 370/3033s or CDC Cyber 70s would be required. One possible disadvantage of this system is the high cost of communications. (See Figure 1(a))

In a centralized system, there would be heavy communications traffic between a major population center and the central facility, e.g., Chicago and Springfield. Cheaper communications costs would result, in these cases, by the use of high-grade leased lines. The establishment of these high-traffic lines to which users dial in would probably require the use of communications computers, minicomputers that handle data and perform some preliminary processing, at these population centers. In essence, this model is a variation of the above configuration. A concentrator may possibly be used instead of a minicomputer. (See Figure 1(b))

Regionalized Network

Here users would access regional or local minicomputers. There is no central computing facility. There would be no linking of the regional computers. Communication costs would be lower. A system like this could utilize, for example, HP-3000s, DEC PDP-11s and perhaps IBM 4300 series computers. (See Figure 2)

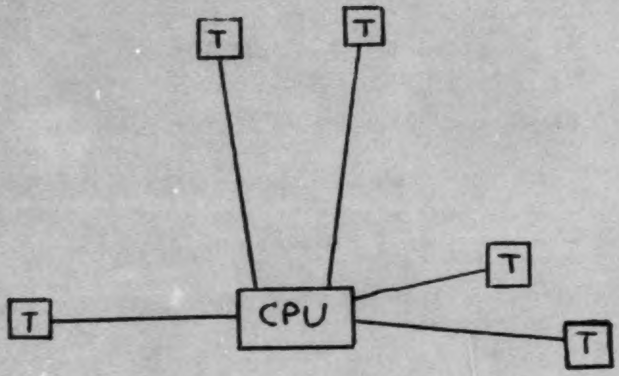
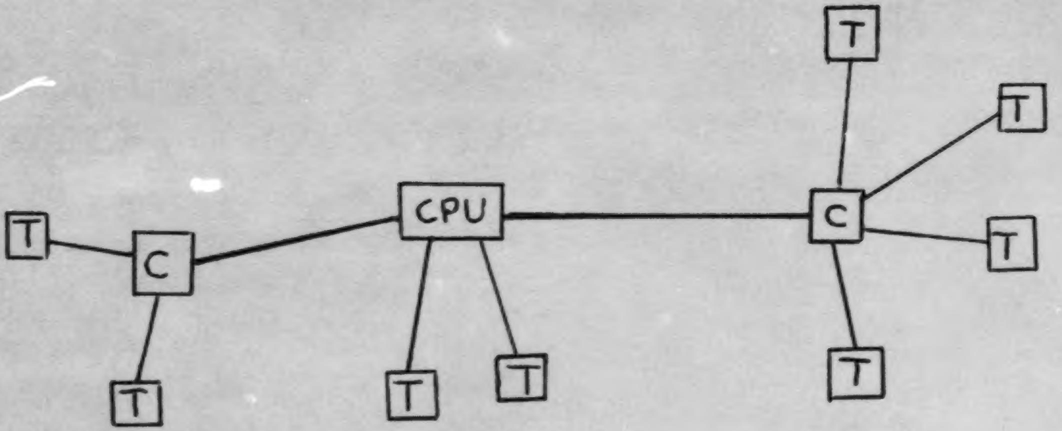


Figure 1(a) Centralized Network


T
T
CPU
C
T
C
T
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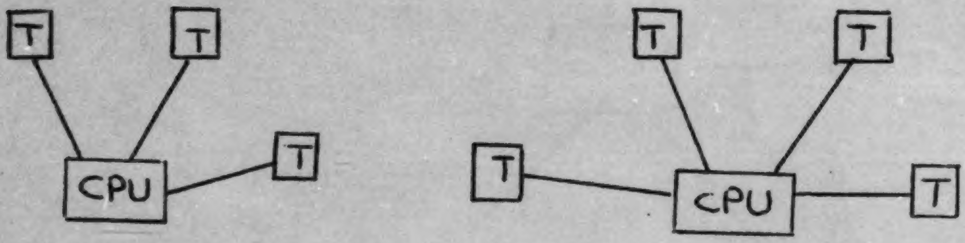
T
T
T

Figure 1(b) Centralized Network with a Concentrator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CPU
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CPU
T

Figure 2 Regionalized Network

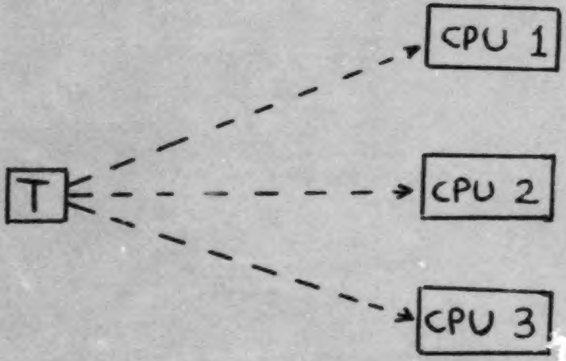
CPU 1
T
CPU 2
CPU 3

Figure 3 Computer Communications Network

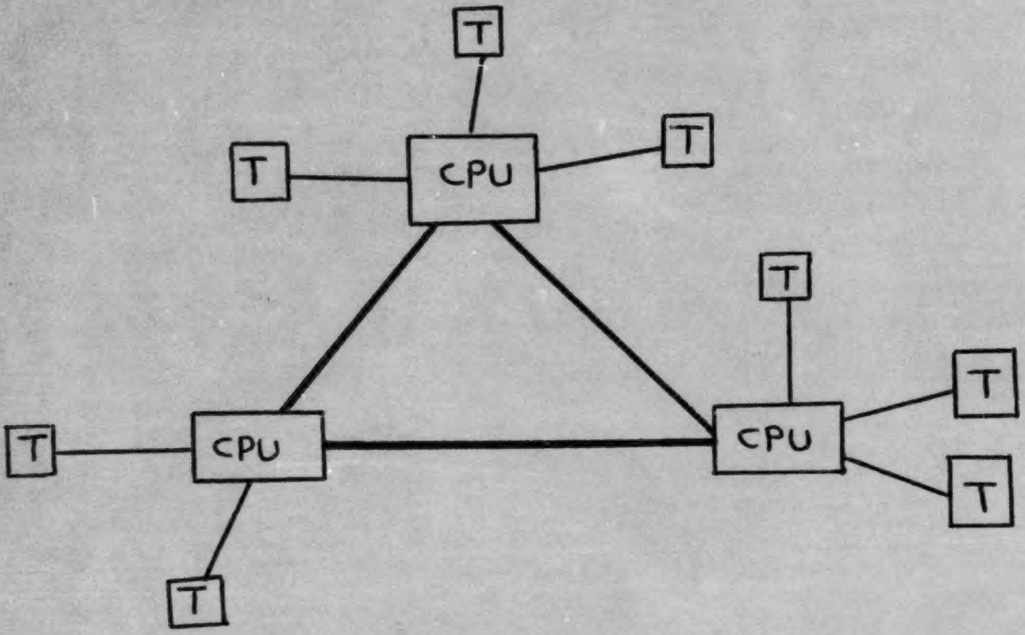
T
T
CPU
T
T
T
T
CPU
CPU
T
T
T

Figure 4 Distributed Network

Computer Communications Network

This arrangement allows the user to select a specific computer facility and dial in. Concerning the Illinois CIDS, this would amount to integrating the existing numerous career information systems in the state into a communications network and allowing users to access the career information system of their choice via the telephone. (See Figure 3)

Distributed Network

The distributed network allows computers to communicate with each other. It includes two configurations which differ in the type of interprocessor communications involved.

Utilitarian Network: Here the processors are combined so that computing resources are shared. Overflows or system failures at one site are quickly handled by other processors. Greater reliability is obtained. (See Figure 4)

Task Network: This configuration is similar to the utilitarian, except that the purpose is to share information rather than computer resources. Here it is possible:

(1) to update all files centrally so that updates are available to all centers right away,

(2) to access the local or specialized files of one region from another,

(3) to conserve disk storage by having occasionally accessed information in a central site, although the small disk storage requirements of CIDS applications may not necessitate this development.

These networks may require specialized equipment such as a communications computer for the network/host computer interface.

3.4.1.3 Non-connected systems.

Batch Update

Computers with terminals where a central source of information exists may operate as local systems with regular update accomplished by mailing floppy disks, tapes or other update materials. Therefore, the communication between computers is done by media other than telephone, microwave or related continuous communication modes.

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Batch Processing

One alternative is the use of batch processing where clients use scoring sheets, forms or other paper and pencil inputs which are then prepared into machine readable form. These machine readable questionnaires or forms can either be entered in optical character recognition (OCR) equipment, punched in by operators or mailed to the computer and then printouts are returned. Here, the major difference is that instead of using terminals or CRTs, the information is collected in the form of questionnaires or OCR sheets. This is a batch and not individualized operation in terms of timing, but individualized outputs are prepared by the central computer. As long as the response is not immediate, waiting a few days or a week can save costs.

3.4.1.4 Microcomputer R&D model.

The following section presents a feasibility study of a microcomputer model for an Illinois career information delivery system. This report was written for the CIDS Feasibility Study by Dr. James Boyd at the College of DuPage.

ILLINOIS CAREER INFORMATION SYSTEM
MICROCOMPUTER VERSION
A FEASIBILITY REPORT

I. Synopsis

This report gives an overview of a proposed career information system for the State of Illinois using microcomputer hardware. This system would be designed to meet the criteria of providing career information to the citizens of Illinois that was accurate, timely, accessible and related to the career needs, interests and abilities of those using the system. It would provide information related to careers and would also provide a method of meeting job skills with the interests and abilities of users. The system would also provide information about various methods of training related to careers such as two and four year college programs, training and technical schools, military careers and on-the-job training opportunities.

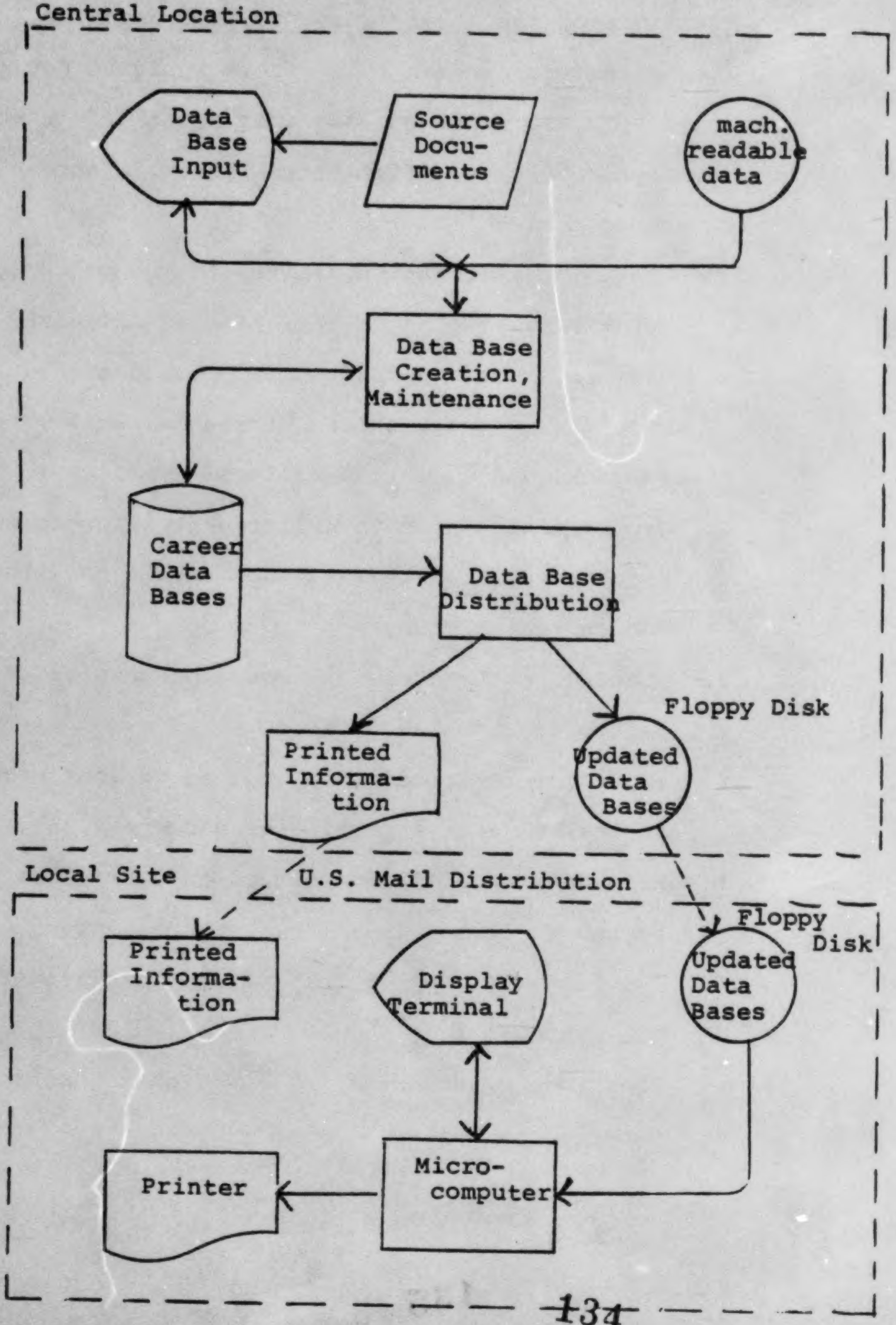
The system would be designed to provide information to citizens in various age categories and from various socio-economic backgrounds. High School students, college students, adults making mid-career job changes and senior citizens would be able to utilize the system.

The system would consist of two major subsystems: a subsystem for creating, maintaining and distributing the data bases; and a subsystem to deliver the information to users at local sites. These two subsystems are presented in the diagram on page and are described in more detail in the next section.

Accessibility to the citizens of the State of Illinois would be provided by the uniqueness of the delivery subsystem. A microcomputer system consisting of a microcomputer with a minimum of 32K RAM memory, two floppy disk drives, a television monitor and a printer would be the only hardware components required for the Career Information System. Software would be developed to operate in a variety of microcomputers such as the TRS-80, and Apple II. Institutions such as public schools, two and four year colleges, libraries, career information centers and other institutions serving the public in the area of career information could use the software package on microcomputers which they already own or which they would obtain for this purpose.

Data bases related to careers, training opportunities and other information accessed by the system would be made available to participating institutions on floppy disks which could be delivered through the U.S. Postal Service. Updating of these data bases would be on a timely basis thus providing information characterized by accuracy and currency. The creation, maintenance and distribution of the data bases would be performed at a central location.

DIAGRAM OF CAREER INFORMATION SYSTEM


Central Location
Data Base Input
Source Documents
mach. readable data
Data Base Creation, Maintenance
Career Data Bases
Data Base Distribution
Printed Information
Floppy Disk
Updated Data Bases
Local Site
U.S. Mail Distribution
Floppy Disk
Printed Information
Display Terminal
Updated Data Bases
Printer
Microcomputer

II. Description

A. Functions of the Career Information System

The system proposed in this report would be designed to perform the functions required of an effective computerized career information system. These functions include:

1. Providing information related to the major occupations existing in the State of Illinois. This information would include job duties, benefits, educational requirements, employment outlook, and local and national employment opportunities and other pertinent information.
2. Matching user's interests and abilities with job characteristics.
3. Simulating the decision making process in relation to choosing a career.
4. Providing information related to various paths of training for a particular career.
5. Recording information related to user's use of system to be recalled in later sessions.
6. Provide hard copy of information retrieved from the system.
7. Creating, maintaining and distributing reliable career data bases.

B. Major Subsystems of the System

The career information system proposed in this report consists of two major subsystems.

1. The Data Base Creation, Maintenance Subsystem

   The subsystem to create, update, maintain and distribute career information data bases would be developed to operate at a central location. (This subsystem could be managed by the State of Illinois or could be contracted to a private firm.) Software and procedure would be designed and implemented to function in an existing computer center. The subsystem would support the creation, maintenance, updating and distribution of the data bases. Source documents related to careers and training opportunities could be obtained from existing sources and supplemented by a central staff.

2. The Delivery Subsystem

   The microcomputer career information system proposed in this report would consist of the following major types of components related to the delivery subsystem.

   a. Computer hardware. The computer hardware required to operate the system would consist of the following:

1) A microcomputer with a minimum of 32K and capable of running under a disk operating system.
2) A display terminal or a television set to serve as a display terminal.
3) Two floppy disk drives providing a minimum of 150K bytes of available auxiliary storage.
4) A printer for providing hard copy to the user. (Note: The hardware could be of various makes and could be used for purposes other than the career information system.)

b. Software Component. The software component would be designed with the following features:

1) Available to the user on a floppy disk.
2) Usable on various makes of microcomputers.
3) Provide the user with reliable operation of the system.
4) Engineered for easy use by the user.

c. Data Base Components. The data base components of the system would consist of data bases related to occupations, training institutions and other related information. These data bases would be created, updated and maintained at a central location on a large computer system and provided on a timely basis to participating institutions on one or more floppy disks.

d. Print components. Print components would provide detailed information about careers and related training opportunities which could be given to users after careers and training opportunities have been identified through the computerized system. This printed information would be made available to participating institutions in "loose leaf" form. The institutions could make copies as needed.

III. Feasibility

There are numerous advantages of the Career Information System proposed in this report as contrasted with the leading systems now in existence. In addition, there are a number of design considerations which must be noted.

A. Advantages. The advantages of the proposed system are:

1. It provides an economical means of getting career information to a large number of users. It minimizes communications cost and the cost of computer hardware.
2. It coordinates with the trend toward an increase in the use of microcomputers for educational purposes.

3. It is compatible with the current state of technology and with the merging of microcomputers and video disks.
4. It provides a means of control of the data bases at the State level.
5. It minimizes the problems inherent in the updating and maintaining of career data bases.
6. It provides the potential broad use of the system in that it functions on available hardware.

B. Design Considerations. While there are numerous advantages of the proposed system, there are several special design problems which must be taken into consideration.

1. Incompatibility of different microcomputers. Since there is no standardization between microcomputers, it would be necessary to develop slightly different versions of the microcomputer software. This increases the development and maintenance cost. This incompatibility would also apply in some cases to the formatting of the floppy disks containing the data bases.
2. Quality control in reproducing data base floppy disks. Accurate and usable data bases would be essential to the operating of the system. A high degree of quality control would be required in collecting and entering data into the system.

3. Cost of data base maintenance. The proposed system implies State control of data bases through either a direct State function or through a contractual arrangement with a private firm. The data base maintenance subsystem would incur significant annual cost. Such cost would need to be passed on to the institutions using the system.

C. Projected costs. The figures used in this category are very tentative and are intended as estimates. More accurate cost estimates would be made during the design phase of the project.

1. Cost of microcomputer hardware system for local site: $3,500.00 - $5,000.00
2. Cost of data base updating charged to local site. Estimated $100.00 per year.
3. Cost of system development: $75,000.00 - $125,000.00
4. Cost of data base creation: $25,000.00 - $40,000.00
5. Annual cost of data base maintenance and distribution: $60,000.00 - $75,000.00

IV. Potential Development Schedule

The figures used in this category are expressed in terms of months after the beginning of the design phase of the project. The phases run concurrently after the design phase.

A Feasibility Report

A. Design of the System -- 3 months

B. Program Development and Testing -- 9 months

C. Data Base Creation -- 9 months

D. Implementation -- 6 months

3.4.2 Examples of Non-Computer Systems

3.4.2.1 Non-computer delivery.

It is possible to operate a system entirely without computers. The use of microfiche, microfilm, textbooks and other materials allows counselors to get occupational information. In some cases these systems are designed as adjuncts to computerized systems. The computerized systems may deal with large populations and/or short distances. Either remote or small user organizations would then go with a non-computer alternative.

3.4.2.2 Referral.

A system which is designed as the referral system may not need any computer, and if so, the computer woudd not deliver services to users. In this case, there could be three components. The first one would be a toll-free 800 telephone number which clients anywhere in the state could call to determine where the nearest and most convenient source of information exists. Referral would depend upon the type of information, location and other parameters. The client would be referred to one or more appropriate systems, which could be computerized system or manual systems. Secondly, such a system could gather data by performing labor market and other studies. This information would then be made available to existing delivery systems. Thirdly, this group could monitor and evaluate the use of CIDS systems in the state and then advise new users as to which networks or systems they should select to meet their particular needs.

3.5 Hardware/Software Compatibility

The chart that follows in Section 3.5.5 describes the current compatibility between the various vendor systems and the various types of computer mainframes and operating systems.

The relationship between the software (in this case, vendor systems) and hardware (in this case, mainframes, minicomputers and operating systems) is critical in selecting a vendor system as a statewide career information delivery system. Compatibility is really a function of four interrelated variables: the vendor system itself, hardware, available resources, configuration schemes. All decisions must account for the relationships among the variables and the resulting constraints.

3.5.1 Vendor Systems

There is a great variety of vendor systems. Some are designed as interactive systems and others are designed for batch use. Among the interactive systems, some are primarily designed for information retrieval, others for counseling as well as information retrieval. Among the systems that provide counseling, some provide assistance with decision-making in addition to focusing on the user's interests, aptitudes and abilities.

As the vendor system becomes more complex, providing more and more services interactively, the more complex and larger the computer programs must become. Examples of the range of complexity are VIP, a batch processing system, written in COBOL which can be adapted to many mainframes and minicomputers, to DISCOVER which was written to be interactive and to be used with a light pen. This more complex system, therefore, requires a larger mainframe with an operating system capable of handling a light pen terminal. Between these extremes are systems such as CIS, COIN, CVIS, EXPLORE, GIS and SIGI which run on minicomputers as well as larger mainframes.

3.5.2 Hardware

As already noted above, the more complex and sophisticated a computer program is, the more sophisticated the hardware and operating system must be. This does not necessarily preclude conversions of programs to run satisfactorily on other types of hardware, but does constrain the process. Conversions usually are expensive, both in terms of the technical and program expertise required and the amount of time needed to write and debug the new program.

Another consideration under hardware is the fact that some computers can be readily linked together in a network. For example, large mainframes such as IBMs or CDCs can be linked. Minicomputers can also be combined: PDP-11s, PDP-11/IBM, PDP-11/CDC, for example.

3.5.3. Available Resources

There are several networks in operation in Illinois: state government agencies have a large network of IBMs and an AMDAHL; several public universities are part of a CDC network. Furthermore, there are hundreds of minicomputers located in school districts throughout the state. Choosing a vendor system compatible with available resources is certainly a reasonable strategy, whether the system runs on a computer network or on individual mainframes or minicomputers.

3.5.4 Configuration Schemes

Again, the type of hardware chosen affects the possibilities for a state configuration. Hardware in turn is affected by the particular vendor system. On the other hand, deciding on a comprehensive or regional model influences the choice of hardware, as much as deciding on a distributed network or free-standing system.

3.5.5 Hardware/Software Compatibility Chart

HARDWARE MFRS / VENDOR SYSTEMS*	CHOICES	CIS	COIN	CVIS
DEC		System 10 System 20 PDP-11 RSTS FORTRAN IV	System 10 System 20 PDP-11	
CDC		Cyber 70 FORTRAN IV		
HONEYWELL		Honeywell 6600 Sigma 6 FORTRAN IV	Honeywell 6000	
HEWLETT-PACKARD		HP2000 F HP2000 ACCESS HP3000 BASIC	HP2000 HP3000	
DATA GENERAL		Eclipse FORTRAN IV		
BURROUGHS	B6700 GEMCOS B6800 COBOL/ALGOL	B1800 B6800		
XEROX		Sigma 9		Sigma 9 Mod II CP-V version D0 COBOL
IBM	370/303X 4300 CICS/VS DL/1 MVS COBOL/ASSEMBLER	EBCDIC tape available FORTRAN	360 370	370/40 DOS 26.2 BTAM 370/3031 MUSIC 370/145 DOS/VS TASKMASTER 370/135 DOS/VS TCP 370: 138, 135, 3031 OS or DOS/VS CICS
COMMENTS	mini/micro feasibility study underway IBM: CICS/VSAM IMS DB/BC underway	micro version in progress	also: UNIVAC 1100 and PRIME 400 available in BASIC and FORTRAN IV	IBM version written in BAL and RPG II

* AEL and VIEW are not included in this chart since they are non-computer systems solely.

VENDOR SYSTEMS

3.5.5 Hardware/Software Compatibility Chart (cont'd)

HARDWARE MFRS	DISCOVER	ECES	EXPLORE	GIS
DEC				System 10 System 20 PDP-11 RSTS 6C
CDC				Cyber series
HONEYWELL				GCOS operating system
HEWLETT-PACKARD			HP3000 COBOL	HP2000 HP2000 C HP2000 F HP3000
DATA GENERAL				
BURROUGHS				6800 series
XEROX				
IBM	370 } CICS/VS 4300 } VSAM/ISAM OS/VS or DOS/VS COBOL	370/145 or similar DMS, COBOL, PL/1		370 series
COMMENTS	requires use of a light pen terminal, e.g., IBM 3270		also: UNIVAC 1100 series written in COBOL	also: TSC 200 available in BASIC, ASSEMBLER and FORTRAN IV

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3.5.5 Hardware/Software Compatibility Chart (cont'd)

HARDWARE MFRS / VENDOR SYSTEMS	PLATO	SCAD	SEARCH	SIGI
DEC				System 10 } underway System 20 } underway VAX 11/780 } underway PDP-11 RSTS E BASIC+
CDC	CDC 6500 Cyber 73-24			Cyber 70 FORTRAN
HONEYWELL				
HEWLETT-PACKARD				
DATA GENERAL				Eclipse C-150 FORTRAN
BURROUGHS				B1000 } underway B6800 } underway
XEROX				Xerox 560 CP-V FORTRAN
IBM				
COMMENTS		no information submitted	batch only no other information submitted	UNIVAC (BASIC+) and PRIME 400 (FORTRAN) underway

3.5.5 Hardware/Software Compatibility Chart (cont'd)

HARDWARE MFRS / VENDOR SYSTEMS	VIP	VOCOMP		
DEC				
CDC				
HONEYWELL	available COBOL			
HEWLETT-PACKARD				
DATA GENERAL				
BURROUGHS	available COBOL			
XEROX				
IBM	370 series COBOL	370 series COBOL		
COMMENTS	also: PRIME at Joliet; NCR--both in COBOL primarily batch process, terminal input possible	batch only		

References

System	Shatkin paper[1]	California report[2]	Vendor publications	Other
AEL		X	X	conversations with Trevor Fox (McKnight)
CHOICES	X	X	X	correspondence/conversations with Philip Jarvis, NC and FL SOICCs
CIS	X	X	X	correspondence/conversations with Bruce McKinlay and Michael Neill
COIN	X	X	X	correspondence with Rodney Durgin, conversations with Robert Nye and Richard Hall (Ideal Systems)
CVIS	X		X	
DISCOVER	X	X	X	correspondence/conversations with JoAnn Bowlsbey, Larry Blasch (IBM)
ECES			X	correspondence with Alva Mallory
EXPLORE			X	correspondence/conversations with JoAnn Bowlsbey and Edwin Sasaki
GIS	X	X	X	correspondence/conversations with Robert Roliardi, Linda Kobylarz (TSC)
SCAD		X	X	correspondence with Lawrence G. Lloyd
SEARCH		X	X	
SIGI	X	X	X	correspondence/conversations with Martin Katz
VIEW			X	correspondence/conversations with John Marshall
VIP			X	correspondence/conversations with John Cripe
VOCOMP		X	X	correspondence with Gary D. Golter

[1] Shatkin, Laurence. Computer-assisted guidance: Descriptions of systems. Princeton, N.J.: Educational Testing Service, 1980.

[2] Ventura County Superintendent of Schools Office. A comparative study of career information systems as they relate to users' needs. Sacramento, CA: California State Department of Education, 1979.

4.0 Illinois Resources

4.1 Introduction

The purpose of this segment of the feasibility study was twofold: first, to determine what computer resources in Illinois, if any, could be used as delivery networks for the statewide CIDS; second, to determine which populations were currently being served by computerized career information systems.

Addressing the first objective involved investigating the services and functions offered by the various computer networks. The most appropriate networks for CIDS delivery were found to include OMIC (Office of Management Information and Communication/ Illinois Department of Administrative Services), PLATO (the computer-assisted instruction package developed at the University of Illinois) and ECN (Educational Computing Network segment of the Illinois Educational Consortium).

Three other resources were also considered: EDUNET, an organization of degree-granting colleges and universities and other related non-profit, tax-exempt organizations, the Illinois public schools and the Illinois libraries. These are discussed in Sections 4.1.1, 4.1.2 and 4.1.3.

Addressing the second objective meant determining which populations within Illinois were being served by a career information system. Section 4.3.1 presents a list of high schools, colleges and correctional centers which have computerized career information systems. Section 4.3.2 presents the availability of computerized career information systems by county. It appears that all but a few counties in Illinois have access to VIP, while GIS is available in most public high schools in the northern third of Illinois. It is not known what percentages of particular populations are being served, but it is clear that more high school students have access to career information systems than any other single group.

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4.1.1 EDUNET

Although membership in EDUNET provides a variety of services designed to expand the number of alternatives for meeting the computer needs of each member's faculty, students and staff, the structure of the network indicates its inappropriateness as a statewide delivery agent. About fifteen colleges and universities nationwide act as suppliers of computer software. EDUNET members can access the software packages through the Telenet or TYMNET communications networks which, in most cases, would mean a local, not long distance, phone charge. The disadvantages to utilizing EDUNET are first, that some university would have to act as the supplying institution; second, that any Illinois educational institution wanting to access the CIDS would have to become an EDUNET member; third, that membership does not seem to be open to state agencies or to high schools; fourth, that EDUNET is a national network and Illinois-specific data in the CIDS would not be relevant to most other EDUNET users.

4.1.2 Illinois Public Schools

The computer resources of the Illinois public schools were also considered as potential CIDS delivery agents, but here too their use seemed inappropriate. According to the Survey of Educational Electronic Data Processing in Illinois Public Schools conducted for the State Board of Education (Department of Data Services, 1979), 393 of the 1014 public school districts presently use electronic data processing, with another 44 districts planning to introduce EDP in the 1980-81 school year. Only 33 districts failed to respond to the survey. Unfortunately, the predominating types of computers were minicomputers and small business computers with only nine in the IBM 360 and 370 series. No attempt was made in the survey to determine the unused capacity of these computers, so that no conclusion can be reached as to what type, if any, of additional software could be run on existing equipment.

4.1.3 Illinois Public Libraries

The Illinois library networks were also considered as a potential delivery network for a CIDS. What was discovered is that there are eighteen systems, seventeen of which are strictly cooperative agreements among individual libraries. Most of these systems have terminals to handle circulation and catalogue information. There is no single computer network that Illinois public libraries use. Therefore, it does not seem that Illinois libraries could be used as a delivery network, but it was determined that individual libraries would be interested in acquiring CIDS terminals.

4.2 Existing Computer Networks

4.2.1 OMIC

The Office of Management Information and Communications (OMIC) provides data processing services to Illinois state agencies which are under the jurisdiction of the Governor and makes services available to local government units, elected state officials and state educational facilities.

After state government reorganization three years ago and subsequent internal reassignments of responsibility, OMIC has improved accountability, planning, management and security functions as well as expanded technical assistance.

Equipment utilized for OMIC services is provided, operated and maintained at a new Centralized Computer Facility. This facility is self-sustaining, financed through a revolving fund which apportions operating expenses among customer agencies. The facility houses a large computer configuration including two IBM 370/3033s, one IBM 370/3031 and an Amdahl 470/V8. A total of six computers at the facility allow a combined memory capacity of 54 megabytes.

Information Management Systems (IMS) and Customer Information Control Systems (CICS) data base and data communication software packages are currently in place at the facility. All IBM utility programs, assemblers, sort programs, compilers and several other software packages provide additional assistance to users.

Nearly 300 3350-type disk drive installations support a total online Direct Access Storage Device (DASD) policy. OMIC's disk vendors are IBM and Storage Technology Cooperation (STC). STC is also the facility's tape vendor.

Application development in Illinois government is decentralized throughout sixty user agencies whose workloads include:

- Over 600 separate major applications
- Over 135,000 jobs per month
- Over 6 million online transactions per month
- Approximately 3,000 terminals in the network

All batch input and output processing is done through Remote Job Entry (RJE).

The operating system currently in use at the facility is OS/VS2, Release 3.8 or MVS. JES2, Release 4.1 controls job input queuing and output for all job entry devices. Time Sharing Option (TSO), an IBM product, is a system within the facility for users to perform cooperative program development and related functions.

Input/output devices available at the facility include 20 3330 Model 11 disk drives, 270 3350-type disk drives, 64 magnetic tape drives, six 2305 Model 12 drum storage devices, a 3211 printer, a card reader, three COMTEN controllers, eight IBM 3705 communication controllers and an IBM 3800 printing substation.

The magnitude of the Centralized Computer Facility's capability becomes evident when one considers that over 200,000 transactions per day are processed through the telecommunications system and that the tape library can store over 92,000 reels of magnetic tape.

OMIC provides the Department of Administrative Services and its customer agencies a summary of OMIC's organizational structure and up-to-date reports on OMIC activities through its publication OMIC BRIEFING.

Even though the six computers within the large configuration all communicate with each other, there are really four distinct systems to handle the data processing needs of all the customer agencies. These are described below:

System	CPU	Memory Capacity	Agencies Served
A	2-3033s	16 megabytes	Department of Public Aid
B	2-3033s	16 megabytes	Bureau of Employment Security, Capital Development Board, Department of Transportation, Department of Personnel, State Employees' Retirement
G	1-3031	6 megabytes	test system only
H	1-AMDAHL 470/V8	16 megabytes	all other agencies, including Department of Commerce and Community Affairs, Office of Education, Board of Higher Education, Illinois State Scholarship Commission, Palatine High School District 214, Riverside-Brookfield High School, Department of Rehabilitation Services, Springfield Area Vocational Center

Given all the resources and all the applications that OMIC currently handles, two important questions arise: first, what is the probability that OMIC can handle another large application like the CIDS and second, how satisfied are current OMIC customer agencies.

Discussions with various OMIC staff members yield a positive answer to the first question. OMIC staff members are enthusiastic about adding a CIDS application since it would be a direct service to the residents of Illinois. In addition, OMIC staff wish to remain ahead of their users' needs by adding whatever equipment and resources necessary to keep quality service.

In order to determine customer agencies' satisfaction with OMIC services, the CIDS Project staff interviewed representatives from 20 of the 72 agencies using OMIC. Reports from all 20 agencies recommended the system quite highly and comments such as "wonderful" and "very pleased" were not uncommon. There were no negative comments on OMIC service. Most users found online response time adequate; one reported slower response times during midday. Another representative mentioned very quick response evenings and weekends, during non-business hours. In addition, it was felt that OMIC troubleshooters and software consultants were of high caliber. Many users reported satisfaction with the speed and reliability of OMIC service personnel. Of the organizations and bureaus interviewed, most were reluctant to allow use of their terminals by clients, directly or indirectly, for career information. However, it should be noted that most OMIC customer agencies do not have clients that have had need for computer services, except for administrative purposes (case histories, unemployment benefits, public aid checks and the like). Given the sensitive nature of these functions, terminals have been dedicated to data entry and have been located in limited access areas away from clients. Schools which use OMIC services, on the other hand, were pleased with the suggestion to allow students/clients to use terminals for obtaining career information. Finally, it should be noted that all the interviewed agencies employ OMIC as a utility, much like the telephone, and not as a service bureau. This status seems to be a strong point for OMIC.

4.2.2 PLATO

PLATO is a national computerized teaching, communications and information network, developed and centered at the Computer-based Education Research Laboratory, University of Illinois at Urbana-Champaign. Development and testing of the system have spanned more than 18 years. The users of PLATO range from grade school students learning reading and mathematics to graduate students in law and medical sciences. The system now has over 1,100 terminals at 200 sites located in universities, colleges, community colleges, public schools, military training schools, commercial organizations, adult learning centers and prisons. Over 600 of these terminals have been active simultaneously. Within Illinois, the breakdown of sites is as follows:

46	University of Illinois, Urbana-Champaign
10	elementary and middle schools
3	high schools
10	community colleges
46	colleges and universities (excluding U of IL)
12	hospitals
34	miscellaneous business, industrial and private sites

The users have access to more than 10,000 hours of instructional material in more than 150 subject areas.

The Computer-based Education Research Laboratory (CERL) of the University of Illinois at Urbana-Champaign was established in 1967 to explore the educational uses of computers. Since that time the laboratory has developed several generations of computer-based instructional systems known as "PLATO" (Programmed Logic for Automated Teaching Operations). With each generation, the PLATO system has increased in instructional versatility, ease of lesson writing and power to reach many students at once with individualized programs.

CERL is divided into three main branches: the Software Group, the Hardware Group and the Education Group. The overall goal of the PLATO Education Group (PEG) is to provide leadership to the computer-based education community in the areas of curriculum development, instructional research and evaluation.

Some of the specific projects that PEG is involved with are the PLATO Job Corps Project, the PLATO Corrections Project and a new PLATO curriculum project. The Job Corps Project is closely related to the needs and interests of CETA training. The Corrections Project includes a pre-GED and GED curriculum, a computerized instructional management/site implementation system (with associated instructor training package) and, more recently, mastery-based instruction in adult reading comprehensive and vocabulary development. The Illinois Department of Corrections has decided to continue exploration of the application of computer-based instruction for basic skills training. The Department's program will expand to include new institutions with a focus toward the development of a model statewide network for GED and adult basic skills training. The PLATO curriculum project is developing a complete reading comprehension program for adolescent and adult learners reading on the fourth to eighth grade level.

The central computer running PLATO is a dual mainframe consisting of a Control Data Corporation 6500 computer working in tandem with a Cyber 73 computer. These two machines together have nearly 200,000 sixty-bit words of central memory storage. There are four central processing units, and twenty peripheral processing units. Permanent storage for the computer programs and lessons is provided by an electromagnetic disk system consisting of eighteen disk drives with a capacity for storing over two hundred million sixty-bit words of data.

In order that hundreds of terminals can run simultaneously with key-response times of one eighth of a second or less, the lessons are taken from their permanent storage on the disk and put into a very fast and relatively low cost swapping memory called extended core storage. There are currently two million words of extended core storage memory, as well as one million words of another kind of fast memory called auxiliary mass storage. The lessons are then swapped in and out of the central memory for processing by the central processors. This timesharing architecture has resulted in very fast transfer and retrieval rates, at relatively low cost.

Communications between the central computer and the terminals is handled by two communications interface units. From the communications interface units, the information is transmitted by phone line to one-, four-, or eight-terminal modems, or by microwave to thirty-two terminal site controllers. Information from the terminal to the computer goes to the modems or site controllers which multiplex the information onto a single telephone line and transmit it to the computer. Each terminal is guaranteed an average of 2.3 inputs per second, which has proven to be adequate for current needs. The system is generally scheduled to be available twenty-three hours a day, and system reliability is very high--more than 95% of the scheduled time has been available to users.

The PLATO terminal has a plasma display screen which is composed of a grid of 512 x 512 plasma "dots" which can be lit or turned off under computer control. Text can be written across the screen at a speed of 180 characters per second, and the programmer can specify graphs and line drawings as well as specially designed character sets. Input to the terminal is via a keyset and a touch sensitive screen. The keyset has all the standard typewriter keys together with special function keys which can be programmed to perform whatever operations are needed for individual lessons. The latest generation of terminals, the PLATO V terminals, have a new plasma panel with expanded capabilities, and have incorporated a microprocessor which can be used for local processing along with the central computer.

Among the other distinctive features of PLATO are an inter-terminal communication capability which permits users to talk online to another user and to monitor another user's screen upon request and the capability for users to write new programs.

The PLATO system provides a means for individualized, self-paced and interactive instruction to large numbers of students at once. This unique and non-traditional learning medium can be an effective teaching aid for the juvenile or adult learner. Attitudinal data indicates that PLATO is thought of as a patient, motivating and non-threatening tutor . It complements and supplements classroom instruction and frees the instructor for special work with students, an advantage which conventional teaching does not usually include. Furthermore, PLATO's data handling capabilities and computational power make it uniquely suited to a broad range of research and development activities.

4.2.3 IEC/ECN

The Illinois Educational Consortium is a not-for-profit corporation whose members are the four Illinois public systems of higher education. Each member annually selects two representatives, one of whom is the member's executive officer, to sit on the Consortium's Board of Directors.

The Illinois Educational Consortium, originally known as the Illinois Educational Consortium for Computer Services (IECCS) was established in September, 1972. Its creation was in response to recommendations made by the Illinois Board of Higher Education and the Illinois Department of Finance to the Joint Counsel on Higher Education which included the executive officers of the four governing Boards and their universities. A need was identified for creating an organization to increase cooperation, coordination and sharing of computing equipment systems, facilities and personnel among the institutions of higher education in the State of Illinois. The Consortium was incorporated as a private not-for-profit corporation to serve the interest of the Illinois higher education community.

The expressed purpose of IECCS (now IEC) was to advance the development and use of computing technology and information systems in institutions of higher education, to achieve improved cost efficiency and to strengthen and enrich the public universities' computational capabilities in support of their educational missions and operations.

A broadened scope of Consortium activities was reflected in amendments to the corporation's Articles of Incorporation which became effective April, 1975. The corporation's name was changed to the Illinois Educational Consortium (IEC). The expressed purpose of IEC is to support and advance the collective activities of institutions of higher education in the State of Illinois as a means of improved management. IEC has encouraged and assisted in establishing inter-university cooperative programs leading to more cost-effective services through resource sharing, collective purchasing, and economical financing arrangements. Community colleges may also join the Consortium as associate members.

The Mid-Illinois Computer Cooperative (MICC) was created under the auspices of the Illinois Educational Consortium in 1974. MICC was established on the premise that certain types of services, such as interactive timesharing and fast turnaround batch processing could be provided most effectively and economically to several universities on a cooperative basis. The process which resulted in the creation of MICC was initiated by inviting the state universities to study their instructional computing needs and alternative methods of satisfying those needs. Five universities decided they had a common need for interactive computing in order to fulfill their education mission, but none could afford the required computing facilities. The five institutions - Eastern Illinois University, Illinois State University, Sangamon State University, Southern Illinois University at Edwardsville and Western Illinois University--formed a task force of administrative and technical personnel to study the overall need and make recommendations. Their recommendations, approved by the IEC, included a central computing facility to support interactive and batch academic processing, an operating board composed of two representatives from each of the participating universities and a computer center staff.

In 1974, the Illinois Board of Higher Education (IBHE), under its grant program called the Higher Education Cooperation Act (HECA), awarded IEC a cooperative computing grant to fund this collaboration which was continued for four years through FY78. This grant initially funded IEC's lease of computer equipment and support staff to provide computing services to these five state universities. Since 1974, the number of universities served has expanded from five to nine. This service program of IEC has evolved into a supplier/consumer relationship with the unincorporated association of universities now being known as MICC . To distinguish the IEC service program from MICC, the association, the name Educational Computing Network (ECN) was adopted for IEC's organization unit which services MICC.

In FY79, the IBHE grant funds which had previously been provided to IEC to support the cost of providing computer services to the MICC member universities was distributed into the budgets of each of the nine universities. This was done to allow them to collectively contract with IEC for continuation of the program. Through MICC, the member universities collectively negotiate with IEC to obtain a special type of service, i.e., interactive, timesharing computing services. MICC's contract with IEC allows MICC, through an operating board, to supervise IEC's delivery of services to the members of MICC.

IEC recently negotiated the replacement of its Cyber 72 for a Cyber 730 with 50% more memory and additional peripheral equipment. The Cyber 730 system will provide about twice the computing capacity and twice the storage capacity of the Cyber 72 previously used.

IEC is in a unique position to provide certain staff support functions to the Governing Boards and the individual universities and to provide advisory and consulting services to various inter-university committees and task forces. One such activity in which IEC is currently involved is the development of a service program associated with the Library Circulation System (LCS) now installed at the University of Illinois.

Several state universities are being provided developmental funds in FY80 to use the LCS system at the University of Illinois. In addition, two community colleges and seven private universities will participate in this program. Due to the cooperative nature of this activity, IEC has been asked by the libraries to participate in the formation and structuring of the LCS advisory organization.

In addition, IEC has interacted with the legislative liaisons of the four governing boards and various legislative committees regarding computer related bills that have been introduced. IEC has also maintained professional contacts with the various government agencies including the Data Information Systems Commission (DISC) and the Governor's Office of Management Information and Communications (OMIC).

4.3 Existing Computerized Career Information Systems

4.3.1 Computerized Career Information Systems in Illinois

CVIS: Willowbrook High School -- Villa Park
Fenger High School -- Chicago
Corless High School -- Chicago
Oakton Community College -- Morton Grove
Proviso Township High Schools
Palatine Township High School District 211
Rockford High School District 205

DISCOVER: College of DuPage -- Glen Ellyn

GIS: Chicago State
College of Lake County
Eastern Illinois
Highland Community College
Illinois State
Kankakee Community College
Kishwaukee Community College
Northeastern Illinois

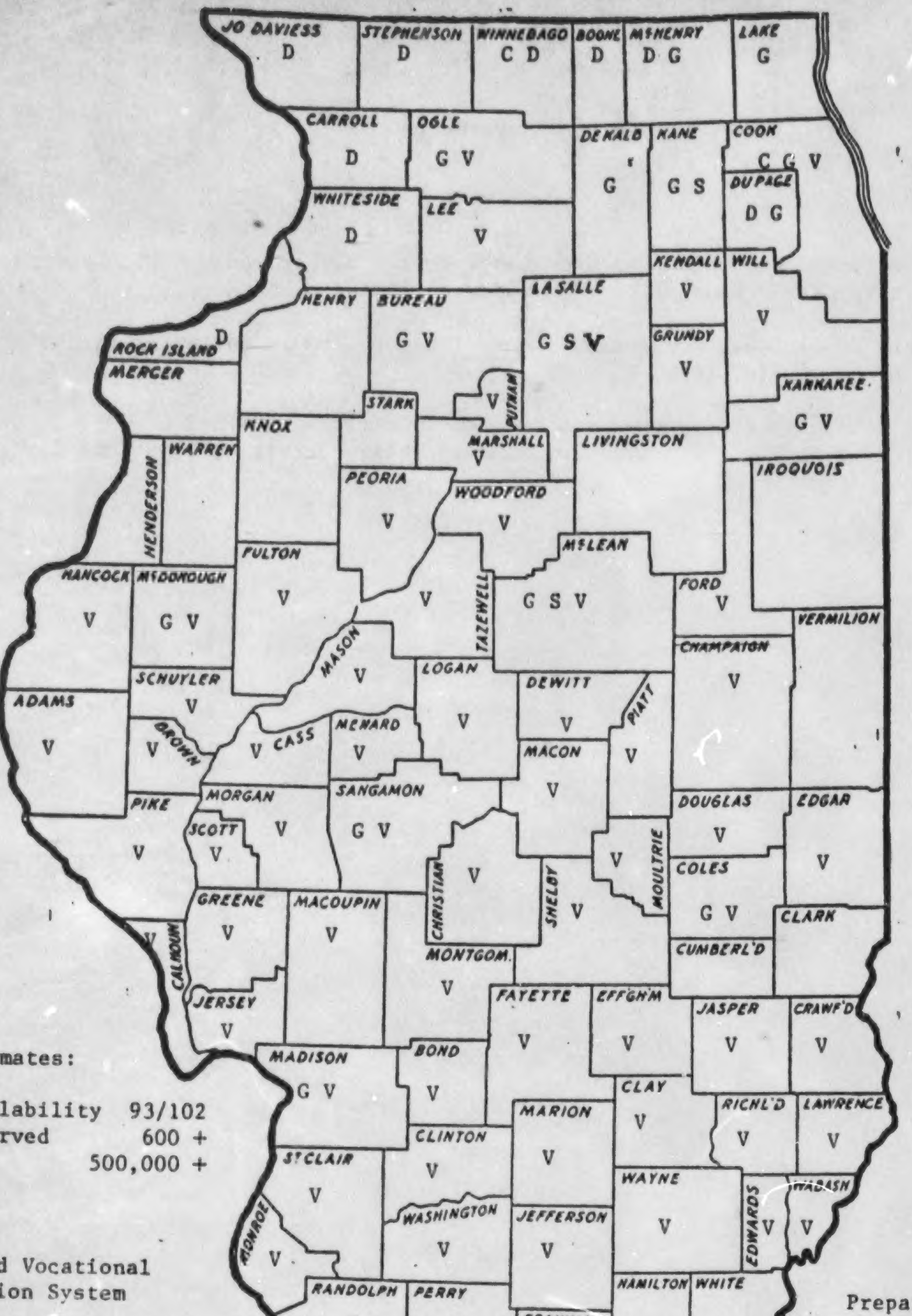
GIS: Northern Illinois University
cont'd Oakton Community College
Sangamon State
Southern Illinois University -- Edwardsville
Waubonsee Community College
Western Illinois University
Adlai Stevenson High School
Argo Community High School
Arlington High School
Barrington High School
Batavia High School
Buffalo Grove High School
Deerfield High School
DeKalb High School
East Leyden High School
Edwardsville High School
Elk Grove High School
Forest View High School
Glenbrook North High School
Glenbrook South High School
Highland Park High School
Hinsdale Central High School
Hinsdale South High School
Hersey High School
Homewood-Flossmoor High School
Johnsburg Senior High School
Libertyville High School
Maine East High School
Maine North High School
Maine South High School
Maine West High School
Marengo High School
McHenry Community High School
Niles East High School
Niles North High School
Niles West High School
North Chicago High School
Oak Lawn High School
Prospect High School
Resurrection High School
Ridgewood High School
Rochelle High School
Rolling Meadows High School
Springfield High School
Stephenson Area Vocational Center
Sycamore High School
Waukegan High School -- East
Waukegan High School -- West
West Leyden High School
Wheaton Central High School
Wheaton North High School
Wheaton-Warrenville High School
Wheeling High School
Warren High School
Woodstock High School
York High School

SIGI: Aurora College
Illinois State University

VIP: Shanahan Boys Camp
Athletes for Better Education
Kennedy Job Training Center
Joliet Junior College -- Joliet
Belleville Community College -- Belleville
Illinois Central College -- East Peoria
Lakeland Community College -- Mattoon
Thornton Community College -- South Holland
Decatur High School -- Decatur
LaGrange Township High School -- LaGrange
Correctional Centers -- Joliet; Pontiac; Dwight

4.3.2

Availability
of
Computerized
Career
Information
Systems
by
County


JO DAVIESS D
STEPHENSON D
WINNEBAGO C D
BOONE D
McHENRY D G
LAKE G
CARROLL D
OGLE G V
DE KALB G
KANE G S
COOK C G V
DU PAGE D G
WHITESIDE D
LEE V
KENDALL V
WILL V
HENRY
BUREAU G V
LA SALLE G S V
ROCK ISLAND D
MERCER
GRUNDY V
PUTNAM V
STARK
KANKAKEE G V
KNOX
MARSHALL V
LIVINGSTON
WARREN
HENDERSON
PEORIA V
WOODFORD V
IROQUOIS
McLEAN G S V
TAZEWELL V
FULTON V
HANCOCK V
McDONOUGH G V
FORD V
VERMILION
MASON V
CHAMPAIGN V
SCHUYLER V
LOGAN V
DEWITT V
PIATT V
ADAMS V
BROWN V
CASS V
MENARD V
MACON V
PIKE V
MORGAN V
SCOTT V
SANGAMON G V
DOUGLAS V
EDGAR V
MOULTRIE V
COLES G V
CHRISTIAN V
SHELBY V
GREENE V
MACOUPIN V
CALHOUN V
CLARK
CUMBERL'D
MONTGOM. V
FAYETTE V
EFFGH'M V
JASPER V
CRAWF'D V
JERSEY V
MADISON G V
BOND V
CLAY V
RICHL'D V
LAWRENCE V
MARION V
CLINTON V
St CLAIR V
WAYNE V
EDWARDS V
WABASH V
WASHINGTON V
JEFFERSON V
MONROE V
RANDOLPH V
PERRY V
HAMILTON V
WHITE V
FRANKLIN V
JACKSON V
WILLIAMSON V
SALINE V
GALLA. V
UNION V
JOHNSON V
POPE V
HARDIN V
ALEX.
V
PULASKI
V
MASSAC

FY 1980 Estimates:

County availability	93/102
Agencies Served	600 +
Inquiries	500,000 +

Code:

Computerized Vocational Information System
Discover
Guidance Information System
System of Interactive Guidance and Information
Vocational Information Program

Prepared by:
Don Hanratty
Special Programs
State Board of
Education
March, 1980

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5.0 Needs Assessment

5.1 Introduction

An analysis of the needs of prospective users, both direct and intermediate, is based on data collected as a result of interviews with representative groups and individuals, plus public workshops held in three locations in the state.

Data utilized in the formation of the Criteria Tree (Section 6) was derived from two waves of interviews conducted throughout the state and three workshops: June 17 in Evanston; June 24 in Springfield and July 1 in Marion. The Nominal Group Technique (NGT) was utilized to identify and prioritize user needs.

A questionnaire completed by workshop participants and others who expressed interest but could not attend further supplemented the data available from which criteria for the selection of a CIDS for Illinois could be derived.

5.2 Interview Data Summary

Interviews were conducted with representatives (usually directors or assistant directors) of agencies and organizations which provide career and occupational information and guidance. Organizations and/or agencies selected for interviews reflect the range of constituencies to be served by a statewide career information delivery system. (See Appendix A for Interview List) Project staff singled out organizations whose mandate is to respond to the occupational needs of particular groups. The interview protocol was designed to elicit descriptive data about clients (particularly their information needs), agency/organization services, information collection, dissemination practices and staff awareness and use and impressions of computer-assisted career guidance. (See Appendix B for Interview Protocol) While much of the interview data reveals commonalities across these diverse agencies, it also points to some significant differences in agencies' needs. Both these views will be summarized below with specific examples and recommendations.

The following analysis is derived from a total of 66 interviews with agencies/ organizations, ten with clients, and one with a counselor in private practice. Those interviewed represented CETA clients, secondary school students, university and community college students, rehabilitation services clients, public aid recipients and veterans. Organizations that specialize in serving women, youth, older adults, Blacks, Hispanics, inmates in a state penitentiary and Indians were also queried. Of the total surveyed, 41 represented organizations that provide services directly to users, 14 represented intermediate user groups and twelve represented CETA Prime Sponsors. Some interviews involved several staff members; in total over 100 people took part in the interview sessions. Two charts following 5.2.7 show the scope of the interview survey.

Because those interviewed were selected with the intention of learning the service needs of a broad spectrum of users, the client characteristics vary greatly in terms of age, race and ethnicity. Yet, each agency or organization questioned tended to serve a relatively homogeneous group. Of those interviewed, 50% serve the disadvantaged, un- or underemployed, CETA-eligible client. The vast majority serve clients with a high school or less than a high school education. Few serve participants whose education extended beyond high school. The exceptions were the organizations serving intermediate user groups which address the needs of teachers or counselors with B.A./B.S. or graduate degrees. Clients of agencies surveyed tended to have some work experience or work history; notable exceptions were those which serve youth 14-16, displaced homemakers, high school drop-outs, handicapped individuals and agencies that serve an exclusively rural population. Many of these agencies reported clients with poor job skills, or who are not job-ready in addition to having poor language, reading and writing skills. Many of the public agencies in exclusively rural areas reported clients with only entry-level skills and poor work histories. Among those interviewed were organizations that work with hospitalized and incarcerated persons and others in residence programs.

Those organizations/agencies with multiple offices across the state reported different clientele configurations depending on the location of the branch site.

Characteristics, particularly those relating to race and ethnicity, distributed differently over the state.

Funding for the programs reviewed generally came from federal or state agencies, colleges and universities, with CETA constituting a significant source. One organization was partially supported by corporate fees; another derived some income from user membership fees and another by a SDIP Federal Grant. Funding ranged from $7-15,000 to $5-6 million a year.

Staffing ranged from two to 456, the largest representing the personnel in offices of a statewide agency. Several agencies reported the use of volunteer help.

Many agencies reported difficulties in estimating the number of clients they served or their average case load. This was due to a number of factors.

(a) Most agencies are available for potential use by a set number of clients. Agencies refer to this figure as the "clients they serve". This figure ranged dramatically between agencies. In a residential institution, such as a penitentiary, this may number in the hundreds; junior colleges may range around 2-6,000; universities with alumni may range from 20-80,000; public agencies sometimes referred to the clients they served by geographic statistics, i.e., a 5-, 12- or 30-county area without knowing their potential client population exactly.

(b) Actual clients served "in the agency" was also a difficult number for some agencies to give. This was largly due to the fact that many private and public agencies are multiple task deliverers. In other words, they do not always count as part of their case load all the people they see at the agency. Thus some agencies have bulletin boards with job listings or information on careers or educational possibilities that iddividuals can come and look at without staff involvement. Agencies also report that they may spend a few minutes with an individual directing them to reference sources within the agency that they can use themselves. Often neither of these two groups is counted in the case load figures. Some public agencies may even do some counseling and information delivery without counting this as part of the case load. This occurs when these agencies are also involved in placement. Since funding is often based on the "number of clients registered and/or placed in a job", counseling and career information delivery alone is often ignored in the agencies' records. Thus these agencies only count the individuals they register for job placement as part of their case load, when in fact much staff time seems to be spent on other career information delivery.

(c) Many agencies report seasonal variations, as well as variations in case load due to changing economical factors. As an example, a small public agency in a downstate rural county reported this year's case load as having doubled over last year's and attributed it solely to the fact that two of the local shoe factories had recently closed.

These and other factors make it hard for some agencies to be specific about the numbers of individuals they actually help. However, where figures exist, clients helped at the agencies range from a low of 30 to as many as 23,000 at a large Job Service Agency.

5.2.1 Recruitment for CIDS Services

Recruitment practices vary depending on the type of agency involved. High schools, colleges, universities, private agencies and agencies designed to meet the needs of special groups report that 50-60% of their case loads are referrals. Public agencies report that the majority of their clients seek services as a result of word of mouth, advertisement, through other public agencies (i.e., courts, DCFS, etc.), churches and community-based groups or just walk-ins. Some public and private agencies report an active campaign of class presentations, orientation nights, workshops and seminars as a means of making their clients aware of the services available.

5.2.2 Networks

An interactive network exists among federal and state agencies providing supportive services to CETA and welfare clients, as well as job openings available in certain areas. Another network between state colleges and universities seems to exist involving an exchange of job information, openings, salaries and descriptions for 4-year graduates. Some private universities also participate in this network. Because of the consistency of the client population served--all 4-year graduates--this job network seems to work very well, and agency staff will "trade-off" job openings or clients depending on supply and demand. Additionally, the system works well because this population is usually very willing to travel. Thus, if the director of a career agency at a northern university is aware of job openings for business majors and has no graduates available at the time, he/she will call the directors of other university career offices and inform them of the opening. This system allows for speedy dissemination of job information and often results in quicker placements than could be achieved through a computer-based retrieval system.

Another network exists between certain agencies and their communities. Several rural agencies reported the existence of networks between themselves and certain key individuals and businesses in their immediate county and adjacent counties. Thus a policeman or postman who moves around the county may call into the agency any job openings of which he becomes aware. Again, this network seems to work well for these agencies and allows for speedy job referrals and placement. As one agency director said, "We know what's available out there in a matter of hours; the problem isn't information, but a lack of jobs."

Less evident is exchange or referral between community-based organizations, private agencies, universities and colleges and public agencies. While some argued that this should be rectified for the benefit of all, others maintained that it would be a waste of effort. It is clear that the sharing of certain job availability information would result in more people finding employment or accessing career information. On the other hand, it is just as clear that the job listings a large university has available for its clients would be of little or no use to a neighboring agency that serves largely high school graduates and high school drop-outs. The exchange of career information and job listings between these two agencies seems to some a waste of resources considering the wide variance in respective client needs.

Thus, there does appear to be a widespread practice among those agencies queried to collect occupational data via networks, relevant and particularized to their clients' needs. Most indicated that they spent funds and personnel time to assemble libraries and files, and to some extent this may reflect a duplication of effort.

5.2.3 Nature of Client Contact

The number of client contacts varied among agencies. Some clients could be helped in a single session lasting from 30-90 minutes, usually when they were seeking just career information. If placement was also involved, additional contact was reported, often by phone; or in the case of clients who registered at a public agency, the client would have to report to the agency every 2-3 months to update his file.

At these agencies there is an automatic de-activation of a client's file after a set period of time, usually 12-18 months or when the client finds employment. Those agencies that report working with handicapped clients, or clients who are not "job-ready" indicated that they have to spend much more time with the individuals. This may involve giving job and career information, testing, counseling and assignment to training classes or workshops before the client is ready to be placed.

Most public and private agencies report client contact during the day. Residential programs, colleges and universities and military programs also report some services available in the evenings and on weekends.

5.2.4 Prevalence of One-on-One Counseling

Consistent across most types of agencies was the desire to do career counseling and job placement work on a one-on-one basis. This not only appeared to be the dominant method utilized by agencies and staff, but even in agencies that utilized printed materials, microfiche, terminal systems and batch processing, there existed a strong belief that one-on-one contact could not be replaced by these methods, and that they should only be seen as adjunct methods to human contact. Of the agencies that had on-site computer or terminal facilities, about half reported direct client use, while the other half acknowledged using their computer facilities exclusively for record-keeping or bookkeeping functions only. Almost all agencies reported their preference and belief that the best career information delivery could be accomplished by one-on-one contact, with varying amounts of additional non-human delivery methods.

5.2.5 Services Offered

Almost all agencies provide a core of services that differed among organizations only in terms of emphasis:

- aid in changing jobs
- aid in upgrading jobs
- job placement
- educational information
- aid in job search
- acquisition of new skills
- apprenticeship

Agency personnel interviewed recommended the following features that they would like incorporated into such a system:

- dissemination of Department of Labor information on high employment pockets throughout the U.S. and trends in the labor market
- motivational assistance and values clarification
- supply and demand information on specific careers throughout the U.S.
- local job information if possible, but only if it can be done quickly "A three-week-old job listing" was deemed not helpful. Turnaround time must be short.
- services should be available to handicapped
- information on new careers
- simple enough language level for all to use
- listing of counseling services in state by region
- reliability, short down-time for computers
- information on positions for graduate students
- lost-cost services
- complete and rapid updating of information
- information on jobs from bordering states
- information on skills training, vocational schools, and technical training on a state and national level
- information on unemployment insurance and workmen's compensation
- information on types of certification, licensing and credentials needed for jobs
- assistance with job search activities
- services should be available to volunteers, career changers and people getting stagnant in their jobs.

Agency staff also recommended the following as alternatives to a computer-based CIDS system:

- Resources could be allocated for visits to high school classrooms by representatives of various jobs, careers or hiring organizations to talk to students about what they do. Field trips to business and industry could also be organized.
- A state program of in-service for the continual training and updating of high school counselors should be initiated. Several agencies pointed out the need to hire or retrain high school counselors to do vocational counseling or job placement work. Counselors are often isolated and need a network, workshops or communication systems by which they can get support, information or assistance in their jobs. Many agencies report dealing with high school graduates who received no assistance during high school concerning career choice or who met with indifference from their counselor when they sought information. These agencies strongly recommend a system to correct poor vocational and career counseling at the high school level.
- Extension of programs which link vocational and training facilities of private and public agencies and the resources of local colleges, junior colleges or universities. This would provide short term skills training for specific kinds of jobs and a number of such sites could be distributed throughout the state.

Additional recommendations offered by those interviewed:

- Offer centralized testing in conjunction with CIDS.
- Market extensively the system once implemented.
- Develop a response capability with information and guidance to individuals affected by strikes and plant closings.
- Expose students in rural areas to a variety of occupations.
- Provide market information by neighborhood.

Almost all interviewed stipulated that a core of information be provided which includes:

- job titles
- job descriptions
- job qualifications - education, skills, requirements
- job locations
- work conditions
- salary
- education/training opportunities
- EEO/AA guidelines
- financial aid

5.2.6 Agency Recommendations

When asked to make recommendations concerning the facilities and services a CIDS system should include, agencies responded in a mixed fashion.

(a) There were a small percentage of agencies which responded negatively to the idea of a CIDS system at all. These felt that they were providing services to their clients adequately and there was no real need for a state system. Reasons given for this view included:

- it would be too expensive to implement and maintain
- it would be too slow in dissemination of information to agencies and clients
- computers and terminals are not sufficient to do the job of career guidance
- high cost to users or agencies
- client populations are too different for an overall system to deal with except only in the most superficial way
- clients' needs are different
- fear of bureaucratic red tape and mismanagement at the state level
- fear of losing jobs or collapsing of services between agencies.

(b) A larger group of agencies responded that if such a system were initiated, it should be designed on a limited scale or serve a specific, well-designated population, such as poverty-level people, CETA clients, rural populations or inner city populations.

(c) A smaller group of agencies were enthusiastic about the possibility of a comprehensive, computer-based CIDS system that would provide information on careers as well as specific job placement information. However, simultaneously there was often expressed skepticism regarding the capacity for a statewide system to furnish all the information clearly and quickly to a diverse population. Recommendations to rectify this were lacking, yet the agencies remained enthusiastic about some sort of wider-state system.

5.2.7 General Observations

In conducting interviews, it became very clear that one of the greatest anomalies of a CIDS system is client immobility. This presents itself in two major forms:

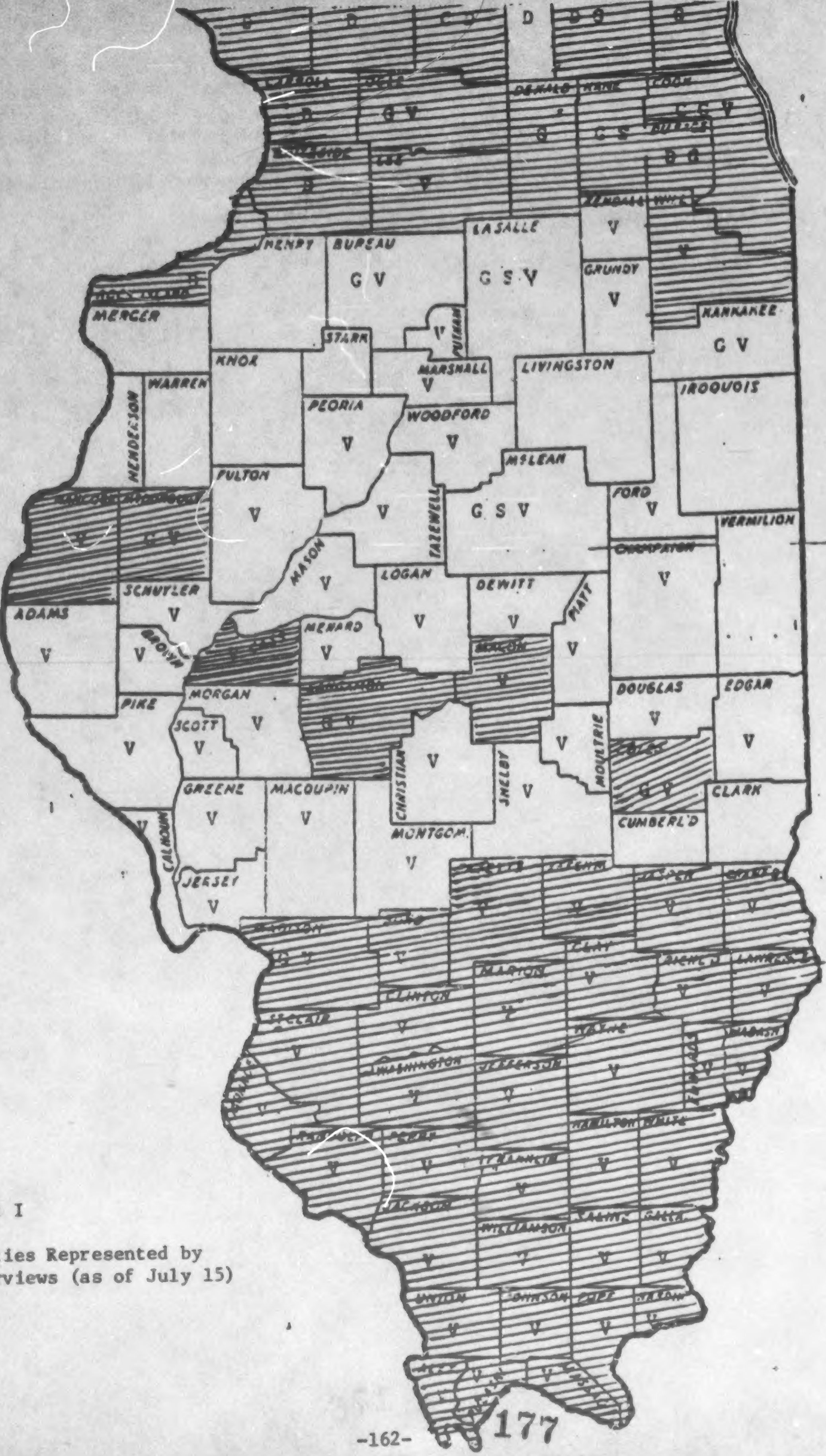
(a) Many agencies, especially in downstate rural counties, report that their clients will not relocate under any circumstance. "Our people do not want to leave the land and the river," and for this reason they greatly reduce their career and occupational options. These agencies state that they do not need a sophisticated CIDS system to deal with 95% of their clients; they need local jobs or at the most, perhaps, vocational training programs. The few individuals who want information on higher education and career options can get it through their high schools or by other self-directed means. Many northern and southern local public agencies report that clients are unwilling to seek employment outside of a limited 30-50 mile radius of where they live.

(b) These same agencies also report that motivation for "careers" is limited with some of their population. "Our clients don't care about careers, or sometimes even jobs; what they really want is a paycheck." Several agencies reported that varying parts of their client population were really not too interested in careers as we define them, but only in getting a local job, or at best, trying for some vocational training. This issue seemed to be equally distributed by race and gender. It should also be pointed out that agencies did not report this phenomenon in a pejorative manner, only that "this is the way things are around here."

For the most part those interviewed were concerned about the quality of the data, its relevance to their clientele and the local currency of the information. Some doubts were expressed, particularly in the rural parts of the state, about the ability of a CIDS to overcome interagency friction and suspicion. Representatives of inner city agencies/organizations tended to be more receptive to a system that would help their clientele match needs with the complex array of training, educational and job placement opportunities available.

Across the multiple constituencies examined there was concern that materials be written at the appropriate reading levels of their clients.

Few of those interviewed knew about computer-based career guidance systems; fewer still had experienced such a system. Those who had knew of GIS, which is fairly well represented in schools and colleges in the state; several of them had heard of SIGI and DISCOVER, but had not had hands-on experience. The majority interviewed responded with interest and enthusiasm regarding the potential of the computer to augment their counseling efforts. There was interest but greater skepticism regarding the capacity of a state-wide system to furnish their occupational, educational and training information needs.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PUTNAM
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MERCER
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Chart I

Counties Represented by Interviews (as of July 15)

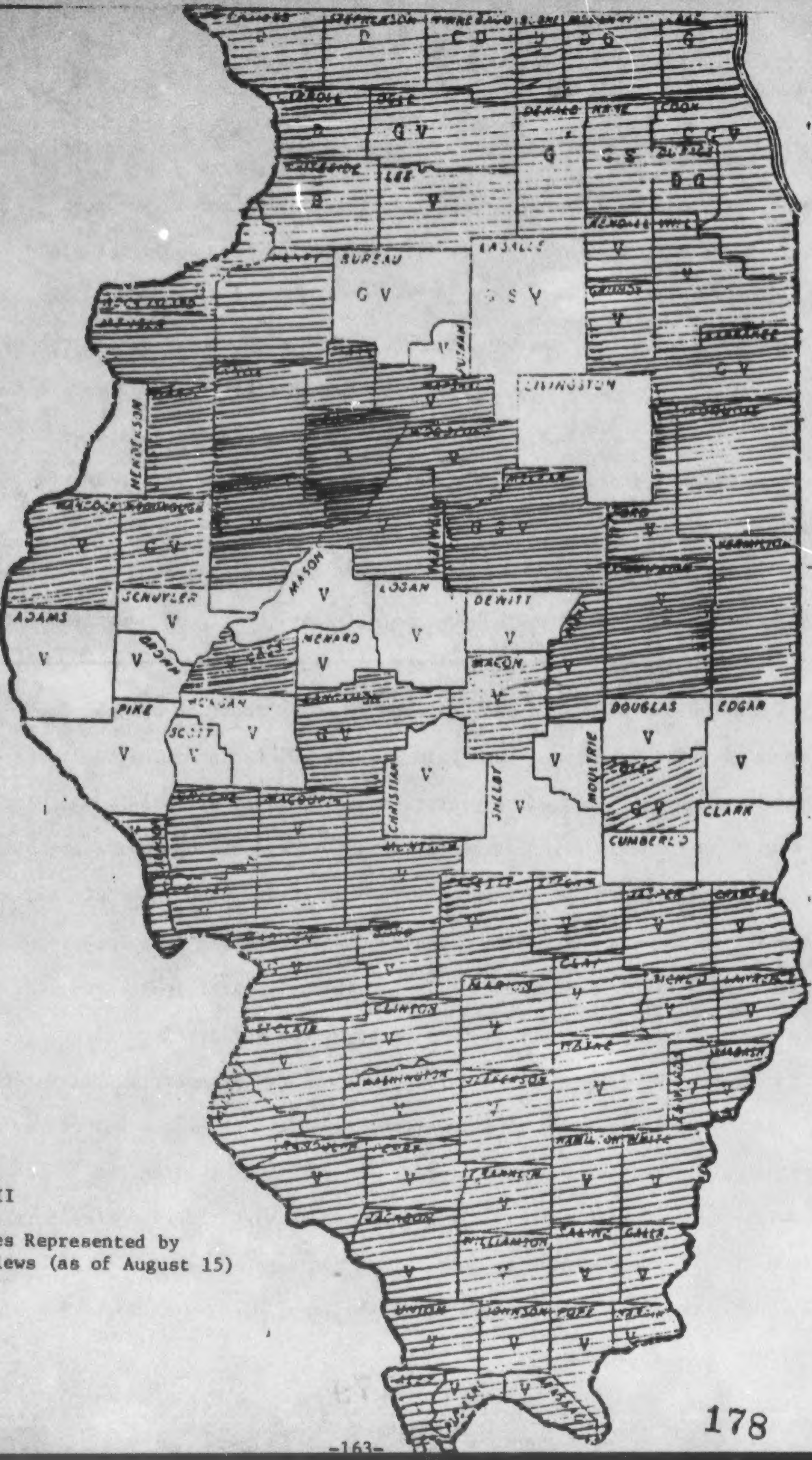
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Chart II

Counties Represented by Interviews (as of August 15)

5.3 Workshops

5.3.1 Introduction

Public workshops were held in three locations in Illinois: Evanston (June 17), Springfield (June 24), and Marion (July 1). A total of 107 people attended (Appendix C is the List of Workshop Participants).

The agendas (Appendices D,E,F)were identical in each site. During the morning session the objectives and methodology of the CIDS Feasibility Study were described, a progress report was presented, questions and comments from participants were entertained and the NGT (Nominal Group Technique) was explained in preparation for the afternoon sessions.

After lunch small groups were formed and NGT leaders conducted the sessions.

Following the small group workshops, participants completed questionnaires. After a few concluding remarks, the meetings were adjourned.

The Nominal Group Technique was selected as an appropriate process for identifying prospective CIDS user needs and establishing priorities. The NGT is a structured group meeting which follows a prescribed sequence of six problem-solving steps. Step 1 is the silent generation of ideas. After the nominal question is presented, the leader asks the group to write down their ideas in brief phrases or statements and to work silently and independently. During Step 2 these ideas are recorded, round robin style, on a flip pad that all participants can see. All ideas are presented equally. The purpose of Step 3, a serial discussion, is to clarify the meaning of items and to explain reasons for agreement and disagreement. Step 4 is a preliminary vote on item importance, where each member selects and ranks a specified number of priority items. The votes are tallied before the group, so that any ideas that need further discussion can be highlighted. Step 5 is a brief discussion of the preliminary vote, where the purpose is clarification, not pressure toward consensus. Then, Step 6, is the final vote, with results again tallied before all participants.

NGT has several features which ensure its value as a CIDS needs assessment instrument. Its greatest virtue is the balance of independent response and interaction which results in both high quantity and high quality of ideas. Search behavior is proactive, characterized by extended periods in generating and clarifying alternative dimensions of the problem. Equality of participation among members is protected by the structured process. Also significant is that NGT sessions tend to conclude with a perceived sense of closure and accomplishment. In this instance, where participants are the prospective users of an Illinois CIDS, closure which fosters interest and commitment was considered desirable.

The primary objective of the public workshops was to arrive at a final set of system criteria which could be ranked and weighted in terms of their priorities. The participants were asked to choose a small fixed number of criteria and to rank them by priorities. Finally, a list of ranked criteria was obtained for evaluating the various vendor systems.

On the following pages are: an NGT Summary (a brief capsulization of the most often repeated items of all NGT sessions); a composite of rankings from the nine groups (4-Evanston, 3-Springfield, 2-Marion) and final ranked lists from each group, indicated by city. Also presented are the results of an initial NGT session with the CIPAC (Career Information Policy Advisory Committee) held on May 28, 1980. The purpose of this preliminary NGT workshop was to expose the advisory committee to the technique and to enlist the assistance of the CIPAC members in framing the nominal question to be used in subsequent workshops. It should be noted that the nominal question posed to the CIPAC differed from that utilized in the workshops.

> The workshop nominal question was:
> What are the features and the services that should
> be part of a CIDS in Illinois?

The CIPAC nominal question was:

What do you consider are the fundamental issues
in implementing and operating a CIDS in Illinois?

5.3.2 NGT Summary

Accessibility by diverse populations including handicapped individuals was the most frequently expressed priority. Also a consistent high priority item was that data be current and accurate. The need to continuously update data was repeatedly stressed by NGT participants as was the need for localized educational and occupational information. Information pertaining to localized employment opportunities (i.e., supply and demand, short and long term employment prospects, anticipated job shortages and surpluses and job openings) was also a concern stressed by participants. Job characteristics such as skill requirements, educational level, licensing requirements, salary and benefits and advancement information, were also thought to be an important informational feature of an Illinois CIDS. The capability to match occupational characteristics to clients' values, aptitudes and interests was considered a significant CIDS feature. Participants repeatedly indicated that they would like to see a CIDS that provides immediate feedback to clients, information on job seeking skills, financial aid and apprenticeships and in general, would enhance guidance processes. At all NGT sessions low cost for users was mentioned. Other high priority items included coordination of existing systems, centralized operations, a variety of delivery modes, support services at the local level, consistency with NOICC, legislative support and a bibliography for counselors.

5.3.3 Evanston NGT

Group 1

1. Localized information
2. Current information

3.5 Centralized operations

3.5 Low cost to users

5. Coordination of existing systems
6. Variety of clients
7. Support services at local level

Group 2

1. Continuous data updating
2. Labor market information: state, regional, local
3. Accessibility - total
4. Educational opportunities information: vocational training locations, CETA, apprenticeships, work-study
5. Availability at small user fee
6. Client service should be convenient
7. Annual user evaluation and appropriate modification

Group 3

1. Occupational titles and classifications consistent with NOICC
2. Local employment opportunity listings (paid and volunteer)
3. Specific job characteristics vis a vis client self-exploration. (Values, aptitudes, interests, motivation)

Group 3 (Continued)

4. Job information geared to postsecondary educational levels (technical, non-technical, graduate, 2-year, 4-year, community college, certificate programs)
5. Current bibliography of career information resources for counselors matched to user characteristics (assessment instruments, referral agencies, educational workshops, potential visitation sites and speakers)
6. Ease of accessibility in terms of population served, schools, groups or individuals, potential cable T.V. hookup, guidance centers and career classes.
7. Provisions for flexibility in relation to client differences (handicapped, language differences, reading level below 6th grade)

Group 4

1. Immediate feedback for clients

2. Geared to specific locations - community colleges, neighborhoods, etc.

3. Priority setting materials about careers for decision making

4.5 Research and evaluation data

4.5 Two or more delivery modes (e.g., hardcopy, microfiche, CRT)

6. List of support materials (local resource data bank)

7. Vocational guidance centers (sources for referral)

5.3.4 Springfield NGT

Group 1

1. Occupational information.
2. Data to be current, practical, accessible; immediate system; minimal response time.
3. Occupational supply and demand data on local, regional, state levels and area labor market information to be exchanged among users.
4. Career exploration and goal-setting for users and career evaluation tools and sources for counselors.
5. Information related to job-seeking skills, interviews, resumes, applications and job retention.
6. Continuous monitoring and program evaluation.

Group 3

1. Should include career information; all degree programs; vocational/technical programs; state licensing requirements, localized labor market data base.
2. Should serve multiple in-school and out-of-school populations; including career information for blind and handicapped.
3. Accessibility and availability for populations mentioned in #2.
4. Continuous maintenance of hardware and software.

Group 4

1. Occupational (related jobs, salary and benefits, advancement information) and educational (2- and 4-year colleges, vocational schools, cross listing

of courses, programs and cost, financial aids, requirements) information.

2. Placement and job opportunities:
    1) Shortages and surplus
    2) Short and long term forecast
    3) Daily update of job openings - centralized plug-in system
3. Accessibility:
    1) Local terminals
    2) Batch system
    3) Hard copy for client
    4) Agency freedom to buy into parts of or the whole system.
4. Values and interests, motivation, self-search of client--also specific talents, skills and abilities that are identified and related to occupational information.
5. Update procedure.
6. Agency pays for CIDS; client serviced free.
7. Centralization of system - computer data bank.

5.3.5 Marion NGT

Group 1

1. Component or module to foster self awareness, career training/preparation information, possible job-seeking skills information and local job placement information.
2. Current, up-to-date labor market information - local, state and national.
3. Easy retrieval of career information, e.g. task analysis, locations of opportunities, pay, experience.
4. Include supply and demand information to support program planning.
5. Job characteristics to be used in self-exploration process.

Additional high-ranked items:

--- Avoid duplicating already-existing information sources.

Group 2 -

1. Job opportunity data should be current - local, state, federal levels.
2. Listings should cover the features of a job/career; i.e. safety, benefits, past union activities, stress, salary, wages, career ladders.
3. Skill requirements needed to perform adequately should be described.
4. A CIDS should be available and tailored to specific target groups: secondary, postsecondary, adult and specialized users.

Additional high-ranked items:

--- Full breadth of careers should be explorable.

--- Referral to find more detailed information (books, agencies, people).

--- Costs and availability of education and training financial assistance.

--- CIDS should be administered by career/placement counselors, properly trained with field experience emphasized. Regularly scheduled professional development.

--- Job outlook data should be provided by placement specialists.

5.3.6 Composite CIPAC List

1. Purposes and goals of a CIDS, e.g. to enhance guidance process.
2. Whose needs do we most want to meet.
3.5 Cost - all phases.
3.5 Variety of access/delivery modes.
5. Accuracy and currency of data.
6. Sources of funding.

5.3.7 CIPAC NGT

Group 1 - Final List - Ranked

1.5 Cost

1.5 Clientele

3. Explicit performance objectives

4. Accuracy and currency of data

5. Variety of access and delivery methods (modes of output)

6. Source of funding

Group 2 - Final List - Ranked

1. Purposes and goals of a CIDS

2. Legislative support including costs

3. Information to be included and its specificity

4. Whose needs do we most want to meet

5. Mixed modes of delivery, different types of output

Additional high-ranked items:

--- Reading levels

--- Interface between guidance, job placement and training

5.4 Questionnaire Data

Sixty-one questionnaires were collected from three public workshops conducted in Chicago (June 17), Springfield (June 24) and Marion (July 1). Completing the questionnaires were representatives (usually directors or assistant directors) of agencies and organizations which provide occupational information and guidance. The questionnaires were designed to elicit descriptive data about clients (particularly their information needs), agency/organization services, information collection, dissemination practices and staff awareness and use and impressions of computer-assisted career guidance. See Appendix H for the CIDS Questionnaire.

The following analysis is derived from a total of 61 questionnaires representing 31 government agencies, 12 secondary schools, 15 postsecondary schools and 2 military organizations.

5.4.1 Clientele

Because of the diversity among these agencies and organizations, the client characteristics vary greatly in terms of age, educational level, reading level, English-speaking abilities and previous working experience. The vast majority (74%) serve clients of all ages (generally 16-65), while a few (26%) serve youths usually ranging in age between 14 and 25. The educational level of clients vary greatly with the majority of agencies/organizations (54%) indicating that they serve clients of all educational levels. Few (7%) exclusively serve clients who have achieved a secondary degree or less. Those serving only clients with secondary degrees, B.A. degrees and graduate degrees totaled 21% and generally tend to be colleges and universities. The reading level of the clients also varied greatly. The majority of agencies (56%) serve clients of all reading levels while a small minority (11%) exclusively serve clients who have achieved a high school reading level or beyond. Those serving clients having less than an eighth-grade reading level are also in the minority (10%). Most agencies/organizations serve clients with excellent English-speaking abilities. Previous working experience was limited for many clients (36%, generally high school and college students). Those agencies/organizations other than secondary and postsecondary schools tend to serve a clientele with some work history.

The number of clients served annually by any one agency or organization ranges from a low of 600 to a high of 325,000. The average client load for public agencies is 2500 to 4000 and for organizations 5500 to 8500. A notable exception is the Southwestern Illinois Planning Commission which serves the populations of seven counties, including St. Clair, Monroe, Clinton, Washington, Randolph and Bond.

5.4.2 Services

Clients are usually served in agency offices (38%) and in classrooms (28%). Meeting clients in career and vocational guidance centers is also common (24%) while client contact in a library setting occurs less frequently (10%). Those responding to the questionnaire indicated meeting clients in some settings peculiar to that agency/organization such as field trips, community events, "on the streets" (Army), at worksites, by telephone and in shopping centers. Meeting clients on an individual basis accounted for most of the client contact (31%) while meeting clients in groups of 1 to 10, 10 to 20, and 20+ are also common occurrences (25%, 23%, 20%, respectively). The majority (57%) provide services for clients during weekdays, a minority (29%) serve clients during evening hours and only a handful of agencies/organizations provide services on weekends (14%).

Almost all provide a core of services that differ between agencies and organizations only in terms of emphasis:

-- career guidance
-- job placement information
-- job placement assistance
-- general educational information
-- school, college, university guidance
-- skills-training opportunities information

Less frequently provided services include:

-- personal counseling
-- career decision making skills
-- vocational assessment
-- work-study programs
-- on-campus interviewing
-- internships and field experience
-- psychological testing
-- actual job training
-- career development in non-traditional occupations
-- financial aid programs

Of the core services provided by almost all agencies/organizations, none can be singled out as "most often provided"; secondary and postsecondary schools invariably provide services such as school, college, university guidance and general educational information more frequently than do government agencies. The latter often provide services such as skills-training opportunities, and job placement information and assistance. Career guidance services are emphasized by all agencies/organizations.

Most frequently utilized in serving clients are personal interviews and printed materials (34% and 33%) and a minority utilize microfiche/microfilm. A minority also utilize computer services (18%).

Over 70% of those responding to the questionnaire were familiar with computer-based career guidance systems; 41% have actually used such systems. GIS, which is fairly well-represented in schools and colleges in the state, was most often identified by those who were familiar with computer-based systems and was also the system with which respondents have had actual hands-on experience. CVIS and DISCOVER were also fairly well known. A few were familiar with VIP remarking that is is "very versatile" and "economical". GIS, CVIS and DISCOVER were most frequently cited as the preferred system. The following are comments by those who preferred GIS:

-- most comprehensive system.

-- usability - individually/within groups.

-- provides exploration with clients and gives information efficiently, quickly, accurately, easily and at a low cost.

-- use it because it is available.

-- has guidance information (quest) components.

GIS also drew some critical remarks:

- GIS...doesn't seem helpful with career information.
- seldom use because of location and manpower requirements.

Comments regarding DISCOVER:

- use because of self-assessment component.
- indepth approach and emphasis on self-knowledge.
- has storage/retrieval, allows for personal self-growth, personal interests, abilities, etc.
- multifaceted.

Comments regarding CVIS:

- low cost.
- current, relevant data bases.
- do not see a majority of students using CVIS--possibly because too high level.

General comments regarding computer-based systems:

- none of the systems are adequate--poor software, lack of labor market information.
- prefer interactive systems--response is immediate.
- preference depends on purpose--all have good components, none is adequate.
- wish all used same data base for same items.
- systems require proper system back-up to meet center objectives.

5.4.3 Costs

Those responding for their agencies and organizations indicated that they would be most likely to assume (or pass on) costs of a CIDS to an annual service contract (38%). Costs related to the purchase of a terminal and fees per student/client were also likely to be assumed (27% and 23%). Respondents indicated that fees based on total student/client populations were least likely to be assumed by organizations (12%). Few respondents were willing to make a committment as to the charges reasonable for their organization to assume. Of those who did respond $.50 - $1, and $1 - $5 fee per student/client were most frequently identified as reasonable charges. $1000 - $5000 fee based on total enrollment, and $1000 - $5000 charges for a yearly contract were less frequently identified.

5.4.4 Preferences for CIDS Features, Models, Availability and Users

Preferences for CIDS features fell into two categories: information and guidance. The majority of respondents (56%) preferred informational features. The exceptions were colleges and universities in Central Illinois who expressed an overwhelming preference for guidance features (58%). The information category was broken down into the following:

-- career

-- school

-- skills

-- occupations

-- placement information

Career, skills training and occupations were most often ranked as important informational features. Government agencies were most concerned with occupational and skills training information while secondary and postsecondary schools were most concerned with school and career information. The category of guidance was broken down into the following:

-- decision making

-- values clarification

-- career choice

-- school/training choice

Decision making was overwhelmingly chosen as the most important guidance feature. Respondents also indicated that career choice was important.

Preferences for CIDS models varied according to geographical region: agencies/organizations in northern Illinois overwhelmingly favored a comprehensive model (63%) while organizations in central Illinios were divided among a comprehensive model and a model decentralized for referral (38% and 33%). Organizations in sourthern Illinois favored a model decentralized for referral (44%). A model decentralized for special populations was generally not identified as the preferred CIDS model by any of the agencies or organizations.

CIDS availability preferences varied enormously among the diverse agencies and organizations. (For example, only 4% of the high schools in northern Illinois identified a consortium of community-based organizations as the favored system by which to make CIDS available to clients, while 60% of the military organizations preferred this system.) None of the seven locations provided--schools (K-12), school districts (1 terminal per district), school districts (more than 1 terminal per district) community colleges, CETA intake offices, community-based organizations--can be singled out as the most preferred.

There was also great diversity among respondents regarding CIDS users. In general, government agencies tended to favor CETA participants and elementary/secondary students as the primary CIDS users (20% and 20%). High schools favored elementary/secondary students as primary users (41%) and colleges and universities favored college students and participants of student skills-training programs as the primary CIDS users. Not surprisingly, military organizations identified soldiers and dependents as the preferred CIDS users.

6.0 Criteria

6.1 Introduction

Criteria building was the primary focus of Phase 2 of the CIDS Feasibility Study. Here is presented the product of the criteria development.

It is quite clear from the Education Amendments (PL94-482) and the CETA Amendments (PL95-524) that the delivery of labor market and educational information to students and clients is a high priority. Equally high in priority is the delivery of this information in an appropriate form for career exploration and decision-making. Given this context, the IOICC adopted two basic policies. First, the career information delivery system is to provide high-quality career information to students and clients who need it, expecially those students and clients who would not otherwise have access to career information. Second, the career information delivery system is to be a system that meets the particular needs of the broadest possible spectrum of career information users.

Ensuring the delivery of high-quality career information which meets the needs of a broad base of users is the purpose of system criteria development. The set of system criteria was constructed in two stages. In the first stage, existing standards were consulted. Existing guidelines for career information systems, namely the ACSCI (Association of Computer-Based Systems for Career Information), CIS (Career Information Systems--Department of Labor) and NOICC standards, became the core for the criteria set. In the second stage, potential Illinois user groups were consulted directly in three ways: through a considerable number of interviews, through the May 28th CIPAC meeting and through a series of public workshops. (Questionnaires completed by workshop participants supported the NGT data.)

All the information gleaned from the second stage was incorporated into the initial criteria set, resulting in the current criteria composite. The sources of support for each criteria are indicated: ACSCI, CIS, NOICC as explained above;

CIPAC, referring to the May 28th meeting; NGT, referring to the public workshops; Interviews, referring to the statewide interviews.

This criteria composite was the primary source of components for the criteria tree. As explained more fully in Section 6.3, the weighted criteria tree describes an ideal CIDS for Illinois, and therefore, this instrument was used as the primary evaluation tool.

Not all of the criteria in the composite became part of the criteria tree; some of the criteria deal with management, structure, marketing, user services, financial support and evaluation of a career information delivery system. These concerns are very important, but more pertinent to system implementation than to system evaluation.

This final criteria composite is organized into six sections. The organizational criteria discuss the management, structure and focus of the CIDS. The information development criteria discuss the occupational and educational topics to be presented. The delivery systems section includes guidelines for the accessing and dissemination of career information. Marketing and user services criteria discuss the various user materials, training and support services necessary to maintain a quality CIDS. The system finance guidelines concern the costs, budget and continuing financial support of the CIDS. Finally, the evaluation criteria discuss those questions which must be answered to assess system impact and performance.

Based on the criteria, a set of system questions and vendor questions was prepared in order to assess the performance of existing state career information systems and vendor systems, respectively. These questions are found in Appendix G.

Immediately following is the criteria composite. Then, the process of weighting criteria is explained, using both the criteria tree and the set of criteria definitions and examples. The weighted criteria tree is also presented.

Section 7 reports the results of the vendor evaluation and offers system recommendations.

6.2 Composite of Standards

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6.2.1 Organizational

Standard I.* (a) Organizational structure of the operating statewide system should include participation of key institutions representing both the producers and users of career information. (ACSCI; CIS; NOICC) (b) There should be a policymaking board of directors which includes:

- Individuals with knowledge and experience in the collection and analysis of career, educational, labor market information; career guidance; curriculum development; economy and occupational structure of the state.
- Producers: education, employment security, economic development, planning agencies.
- Users: user agencies, employers, organized labor, client groups. (NOICC)

Standard II.* A charter, constitution or by-laws should govern the policies of the system. (ACSCI; CIS; NOICC)

1. There should be a governing document available and up-to-date.
2. Formal and informal agreements should be specified with the participating or supporting organizations.
3. Policies and/or procedures should be adopted to carry out the charter, constitution or by-laws.
4. The charter, constitution or by-laws should set the principal purpose of the organization as the development and computer-based delivery of career information.

*Implementation criteria; not used in choosing a system.

Standard III.* Management of the system is located within the system's defined area. (ACSCI)

1. The system's service area should be designated.
2. The central office for the system should be located in the service area.
3. Other offices should be organized to bring user services support to significant user populations.

Standard IV.* The system should have a director to coordinate and manage the operations, provide leadership for the organization's activity and serve as a liaison to advisory bodies. (ACSCI; CIS; NOICC)

Standard V. Professional staff members should be available to:

1. develop information,
2. manage the delivery system and
3. assist user agencies in disseminating information to clients. (ACSCI)

Standard VI. Management should provide inservice training for existing and new staff directly or through vendor. (ACSCI)

Standard VII.* The sponsoring organization should engage in interagency cooperation to maximize quality and minimize cost. (NGT)

Standard VIII. The operating organization should have a broad base of diverse users. (CIPAC; NGT)

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*Implementation criteria; not used in choosing a system.

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6.2.2 Information Development

Career information is generally understood to include both occupational and educational information. Whether a system develops occupational information or educational information or both, it should operate a comprehensive, timely and accurate information development program.

Standard I. The number and types of occupations should reflect the occupational structure of the area served and should cover 90 percent of total employment in the system's service area. (ACSCI; CIS; NOICC; CIPAC; NGT)

1. Any occupation for which there is a very broad or national market should be included. (NOICC)
2. Occupations should reflect all levels of preparation and training. (NOICC; NGT)

Standard II. In developing topics of occupational information, any topic selected should have an empirical base. (ACSCI)

1. To the extent labor market conditions warrant, items or topics of occupational information should be localized. (CIPAC; NGT)
2. A plan should be developed to address which topics should be localized and the extent to which localized information is available. (NOICC)

Standard III. A system should develop information which adequately describes the occupation. Occupational topics may include but not be limited to the following: (ACSCI)

A. Dictionary of Occupational Titles (DOT) - 9-digit codes
   Standard Occupational Classification (SOC) - 4-digit codes
   1. The SOC 4-digit code should be used in identifying occupations.
   2. The DOT code should be based upon the fourth edition of the Dictionary of Occupational Titles.

3. The assigned DOT code should reflect the contents of the occupational description. (ACSCI; CIS; NOICC; CIPAC; NGT)

B. Duties Topic (ACSCI; CIS; NOICC)
   1. The duties topic should describe the purpose of the occupation, the responsibilities held by employees and tasks performed. (NGT)
   2. The primary duties of the occupation should be identified. (NGT)

C. Abilities Topic (these are natural abilities or capacities for learning rather than learned skills) (ACSCI)
   1. The primary abilities needed to perform the occupation should be identified. (NGT)
   2. The abilities should be described so that they are easily identified, e.g., working with hands versus manual dexterity. (NGT)
   3. Other occupations should be identified that have similar skill or knowledge requirements (skill transferability). (ACSCI; NOICC; NGT)
   4. There should be information on related occupations or job families. (NOICC; NGT)

D. Working Conditions Topic (ACSCI; CIS; NOICC)
   1. Working conditions (e.g., indoors or outdoors, work week and schedules, working conditions such as stress, travel requirements, physical settings, safety, etc.) should be described. (ACSCI; CIS; NOICC; NGT)
   2. Information on the work environment should be related to the occupation (e.g., type of supervision or people in the work situation, organization structure, etc.) and described. (CIS; NOICC; NGT)

E. Equipment Topic (ACSCI; CIS; NOICC)
   1. The information should describe special tools, equipment or instruments used in the occupation. (NGT)
   2. The function of complex tools should be described.

F. Earnings and Net Advantage

1. The earnings topic should reflect the current beginning, average and range of wages. (ACSCI; CIS; NOICC; NGT)
2. Union and non-union wages should be identified. (ACSCI)
3. The earning topic should also reflect wages for experienced workers. (ACSCI; NGT)
4. Salaries should be reported consistently: hourly, weekly, monthly or yearly. (ACSCI)
5. Wages should be reported to take into account regional differences of the state or nation. (ACSCI; NGT)
6. There should be information on fringe benefits, such as vacations, insurance, etc. (CIS; NOICC; NGT)
7. There should be information on costs to workers, such as union membership, tools and equipment, etc. (CIS; NOICC)
8. There should be information on any on-the-job training opportunities. (NOICC; NGT)

G. Employment Outlook Topic (ACSCI; NOICC)

1. The topic should outline the projected supply, demand and employment for the occupation. (ACSCI; CIS; NOICC; NGT)
2. The topic should describe the relationship between supply and demand. (ACSCI; CIS; NOICC; NGT)
3. The factors which affect outlook (technological, economic, demographic) should be identified and described. (ACSCI; CIS; NOICC)
4. The topic should give the number of workers in the occupation and other related data, such as industry employment, geographic distribution, self-employment, etc. (CIS; NOICC)

H. Requirements of the Occupation Topic (CIS)

1. Personal requirements: interests, aptitudes, abilities and physical qualities that can be related to characteristics of the occupation (e.g., requirements for lifting, working with detail, ability to see results of work, etc.) should be presented. (CIS; NOICC; NGT)

2. Preparation requirements, such as general education, school subjects or courses of study, special training, education or previous work experience should be described. (CIS; NGT)
3. Other requirements should be described, such as licensing or certification information, information on associations or unions, information on examinations that may be required, information on requirements such as citizenship, language, etc. (CIS; NOICC; NGT)
4. Opportunities for special groups (e.g., special hiring programs for minorities, training program graduates, handicapped, etc.) should be identified. (CIS; NOICC; NGT)

I. Methods of Entry and the Internal Labor Market

1. The topic should describe the common methods of entering the occupation. (ACSCI; NOICC)
2. If the occupation is not entry level, qualifications for entry into the occupation should be stated. (ACSCI; NOICC)
3. The opportunities for promotion or career advancement (career ladders or lattices) should be stated. (CIS; NOICC; NGT)
4. Information on apprenticeships should be provided. (NOICC; CIPAC; NGT; Interviews)

J. Related Occupational Information

1. Education locations should be identified.
2. Training information (CETA, apprenticeship, vocational and adult education and military programs) should be provided. (NOICC; CIPAC; Interviews; NGT)
3. Information on financial aid and assistance (scholarships, loans, grants, work-study programs, etc.) should be provided. (NOICC; CIPAC; Interviews; NGT)
4. Information on conducting a job search should be provided. (NGT)
5. Information specific to the needs of special populations (disadvantaged, handicapped, minorities and women) should be presented. (CIPAC; Interviews; NGT)

Standard IV. Format, style and language levels of the occupational description will be presented so that they are easily understood by a diverse population. (ACSCI; CIS: NOICC; CIPAC; NGT)

1. The reading level standard should be appropriate for the various user groups. (ACSCI; CIPAC; NGT)
2. The statements should be impartial. Evaluative terms should be avoided, i.e., avoid orientation or biases toward one kind of work, career preparation, education or training opportunity over another. (ACSCI; CIS; NOICC; NGT)
3. The occupation description should avoid racial, sexual and other status references in both the occupational titles and contents of the description. (ACSCI; NOICC; NGT)

Standard V. A system should make maximal use of data that are current and valid for developing occupational information. (ACSCI; CIS; NOICC; CIPAC; NGT; Interviews)

1. The information development staff should be aware of the federal, state and local agencies which produce occupational data. They should obtain copies. (ACSCI; CIS; NOICC)
2. The information development staff should identify the strengths and limitations of the resources used. (ACSCI)
3. Means should be utilized for updating the library of printed resources. Adequate monies should be budgeted for this task. (ASCCI)
4. Information development staff should adequately document the resources used for developing occupational topics. (ACSCI)
5. CIDS should use available data and information and avoid the direct collection of data whenever possible.
    a. Sources of national information include the BLS, ETA and Bureau of the Census. (CIS; NOICC; NGT)

       BLS -- Occupational Outlook Handbook
              Occupational Outlook Quarterly
       ETA -- Dictionary of Occupational Titles
              Job Bank Openings Summary

b. Sources of state and local information include state employment security agencies affiliated with the ETA, planning bodies, state departments of education, city and county governments. (CIS; NOICC; NGT)

Standard VI. The career information system should deliver career information in a variety of formats. This may include:

Career Fiction. An occupational description portrayed through characters in a short story or novel.

Biography. Career information presented via biographical materials consists of the real life account of a person as he or she prepares for and advances in a specific career.

Single Job Information. Consists of information covering a single occupation. Usually it consists of an occupational brief of several pages which is presented for exploratory purposes. (NGT)

Job Family Information. Consists of information on a field of work consisting of numerous related occupations such as "classroom science," etc. (NGT)

Jobs in a Specific Business, Industry or Services. This consists of information on the occupations represented in a specific industry, business or service. (NGT)

Recruitment Literature. This consists of information designed to recruit or attract people to a particular field or career.

Orientation -- World of Work. This consists of information developed to assist people in making occupational choices. (NGT)

Special Groups. This consists of information specially designed for specific groups such as the handicapped, disadvantaged or women. (CIPAC; NGT; Interviews)

Bibliographies. Consists of listings of books and materials dealing with career and occupational information. (NGT)

Directory. Consists of lists of institutions offering education and training for occupations or career. (NGT; Interviews)

Financial Assistance. This consists of sources of information on the provisions of financial assistance for career or occupational training or education. (CIPAC; NGT; Interviews)

Other Types of Publications. This includes other diverse occupational and career information including such things as posters, reports, charts, etc. (NGT)

Standard VII. All occupational information is validated and updated at least yearly. (ACSCI; NOICC; NGT)

*1. Procedures should be outlined for the information development staff in updating information. A schedule for updating each source should be drawn.

2. The information development staff should utilize a validation process for updating the occupational information.
   - a. Validators should review each occupation.
   - b. The validators should be employed in the occupation which they are reviewing. When appropriate, the validators should represent education, labor and industry.
   - c. The occupational descriptions should be reviewed often.
   - d. Methods for recording validators' comments should be used regarding this information.
   - e. Validators' names, addresses and comments should be easily accessible to the information development staff.
   - f. Adequate guidelines should be provided to the validators to assist them in reviewing the occupation.
   - g. Validators should be added or deleted from the validation process.

3. Means should be provided for users and interested parties to provide feedback to the information development staff. (NGT)

Standard VIII. If an accessing strategy is used, an empirical relationship should exist between characteristics of the user and those

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*Implementation criteria; not to be used in choosing a system.

of the occupations or educational programs in the system. (ACSCI)

1. The direct access approach and/or the structured search accessing strategies should be used by the system.
2. This relationship should be based upon standard research methodology.
3. The information development staff should understand the process of assigning codes to these traits.
4. The text of the occupational information should support the coding of these traits.
5. The questions developed in the access strategy should confirm current career development theory and practice.

Standard IX. The number and types of postsecondary educational programs should cover all significant instructional programs in the state or region served. (ACSCI; NOICC; NGT)

1. A method should be used for collecting information about what schools are offering specific programs.
2. The list of schools and the programs they offer should be validated.
3. All schools in the system should be represented in the program files.
4. Occupational objectives data should be supported.

Standard X. The number and types of postsecondary educational institutions should include only schools that are accredited or licensed by recognized organizations. (ACSCI; NOICC)

1. Information on school accreditation and/or licensing should be provided. (NGT)
2. Information about school openings and closings during the year should be provided.

Standard XI. School information topics may include, but not be limited to, information about general information, admissions, housing costs, financial aid and student services. Other detailed information can be provided as available and applicable. (ACSCI; NOICC; NGT)

Standard XII. Formating of information about schools should be consistent in reporting to enhance comparability of information items among schools. (ACSCI; NOICC)

1. Information items should cover similar subjects to enable the user to compare information items for several schools.

Standard XIII. Preparation information should include information on the relationship of occupations to educational programs, for example, training options, needed skills, occupational relevant education programs, tips for entering or advancing within occupation, lists of high schools subjects applicable to career field. (NOICC; NGT)

Standard XIV. Systems should have additional files appropriate to their needs which enhance system capability. (ACSCI)

1. Each file should have a purpose.
2. Each file should be developed and maintained in accordance with occupational and educational files previously described (i.e., updated annually, accurate, comprehensive, etc.)

6.2.3 Delivery Systems

The delivery of career information to users includes two broad functions: accessing and dissemination. Accessing is the strategy or approach used by the individual to search out and explore information. Dissemination is concerned with the provision or availability of the information for a wide cariety of users. The following operating standards for accessing and dissemination should be met by a system. (CIS)

Standard I. The system should employ at least two media of delivery. (ACSCI)

Standard II. The delivery system should be demonstrably effective with persons of varying ability and experience. (ACSCI; CIS; NOICC; NGT)

1. The interaction between a client and a machine should take place in a human-oriented language. (ACSCI)
2. The vocabulary used should be part of everyday language which people are accustomed to. (NGT)
3. Ineffectiveness with any of the user groups should be reported. (ACSCI)

Standard III. The delivery system should present information in an attractive and interesting manner so as to motivate users to continue use of the system and to further explore occupational areas. (ACSCI; CIS; NOICC)

1. There should be evidence of the presence of this motivational factor in the delivery system. (ACSCI)
2. The system should be aesthetically appealing.
3. It should deliver information at a level appropriate to the clientele. (NGT)
4. It should deliver information in an interesting style with visually appealing print, illustrations and charts.
5. The printing should be legible and easy to read.

Standard IV. The delivery system components should be user-operable so that independent usage may be fostered. (ACSCI; CIS; NOICC)

1. Feedback should be provided by user agencies concerning ease of use by the individual user. (ACSCI; NOICC)
2. Users of varying abilities have access to desired information without assistance. (NOICC)
3. Clients should be aware of the effects of the sequence of their choices in narrowing or expanding the range of occupations to be explored. (NGT)
4. The user should be permitted access to any information in the system. (ACSCI; CIS; NOICC)

Standard V. The system should provide user agencies with booklets or sets of instructions on how to use the various components for distribution to users. Such instructions should include directions for operating the various hardware components and descriptions of the information files available in the system. The instructions should be written at a reading level appropriate to a wide variety of intended users. (ACSCI; CIS)

1. Booklets or operating instructions should be readily available to system users. (ACSCI; NOICC)
2. These instructions should be easily understood by users who vary in abilities. (NOICC)
3. The number and types of booklets or operating instructions distributed by the system should be described. (ACSCI)
4. Feedback reports from user agencies should indicate any problems with the user materials. They should also state what action was taken. (ACSCI; CIS; NOICC)

Standard VI.* Materials to which users are referred by the system should be available in an easily accessed information center. (ACSCI; CIS; NOICC)

1. A method should be used by the system staff to determine if this standard is being observed at the user site. (ACSCI)
2. There should be action taken by the system if this standard is not being observed. The results of this action should be reported. (ACSCI)

Standard VII. The statements made in one medium should be consistent and compatible with those made in other files or media and a system should be present that refers users from one delivery vehicle to another. (ACSCI; CIS: NOICC)

1. The staff should be responsible for insuring that consistent information is given in all the files and in all of the delivery media. (ACSCI; NOICC)
2. There should be a method for referring users from one delivery vehicle to another. (ACSCI; NOICC)

Standard VIII. Any delivery system hardware components required should be standard equipment that is reliable, widely available and applicable to a variety of users. Computers in use should be subject to minimum down-time and software should be bug-free so users will not be inconvenienced. (ACSCI; CIS; NOICC; NGT)

1. Problems concerning hardware reliability should be reported. (ACSCI)
2. The process used by the system in choosing or recommending hardware components to user agencies should be described. (ACSCI)

*Implementation criteria; not used in choosing a system.

3. To be highly reliable, a system should:
    - (a) have a demonstrable record of consistent operation,
    - (b) use standard equipment widely available,
    - (c) tolerate hard use,
    - (d) if an electronic system, have a backup system to be used during "down-time" or updating,
    - (e) not require extensive periods of time for modifications or updating, (NGT)
    - (f) if mechanical or electronic, have staff available to assist in solving the system's problems,
    - (g) have repair parts readily and easily available.
4. Computer software should be checked for reliability and should be updated when appropriate. (ACSCI; NGT)
5. There should be a system staff member responsible for supervision of delivery systems hardware and software. (ACSCI)

Standard IX. The delivery system must be able to provide a copy of a summary of its basic information to the user for future reference. (ACSCI; CIS; NOICC)

1. A printed copy of information should be available to users no matter what type of delivery system or hardware component is being used. (ACSCI; NGT)
2. Users should be allowed to obtain any amount of material from the system. (ACSCI)

Standard X. The delivery system should be able to house all information related to the topics listed for information development, including localised information. (ACSCI; CIS; NOICC)

Standard XI. The system must have an updating capability so that new information can be entered into the system and made available to users within at least six months of the time it becomes available. Some exceptions exist, primarily, data items that are published and are accurate on a yearly basis. (ACSCI; CIS; NOICC; NGT)

1. Files should be easy to update. (ACSCI)

Standard XII. A user should be able to obtain the information desired which is available through that medium of delivery before leaving the system or within a reasonable period of time. (ACSCI; CIS; NOICC; NGT)

1. If ancillary information is available within the system, it should be delivered to the user within two weeks.
2. The duration of a single session should be stated.
3. Guidelines should be constructed for the number of sessions and the total time required. (ACSCI; CIS; NOICC)
4. Help should be provided to users who are having difficulty in locating information that exists within the system. (ACSCI)
5. Users should report an excessive time lag in receiving information. (ACSCI)

Standard XIII. The accessing strategies or approaches used to obtain information should be availble both in a direct access and a structured search mode depending on the preferences of the user. (ACSCI; CIS; NOICC)

1. Both types of accessing strategies should be available to the system users. (ACSCI)
2. For the direct access approach, Standard Occupational Classification numbers should constitute at least one way to directly

access information in the system. (CIS; NOICC)

3. For the structured search, users should be able to relate occupationally-relevant factors to the total number of occupations in the system. The system should permit changes as desired. Structured search strategies must be based on data available for all occupations.

Standard XIV. If an accessing strategy provides for the use of a client's records (e.g., test scores, class rank, interest inventories, etc.) the client should be aware of all test scores and personal records which are input into the system. Furthermore, the use of client records must not prohibit a client from continuing exploration in any chosen occupational area. Client records, records of individual system use or any other personal data obtained or used by the system for whatever purpose must be adequately safeguarded so that their security and confidentiality will be maintained. (ACSCI; CIS; NOICC)

1. The delivery system should allow the input and storage and retrieval of the client's biographical data and other personal data. (ACSCI; CIS)
2. Personal records should not be used to limit system use in any way. (ACSCI; CIS)
3. Safeguards should exist to protect confidentiality of records, if personal records are used. (ACSCI; CIS)
4. The clients should be made aware of the fact that personal records are being used. (ACSCI; CIS)

Standard XV.* The delivery system should be available and accessible to adequately serve the user site.

1. Users should be able to access the system during their regular day and, if possible, both before and after. (ACSCI; CIS; NOICC; NGT)
2. Printed material should be easily accessible to users. (ACSCI; CIS; NOICC; NGT)
3. The system should have standards describing the amount of equipment and materials per site. (ACSCI
4. The system should be housed in a central location. (NGT)
5. The system should provide for confidential and non-conspicuous use.

Standard XVI.* Costs for the delivery system components should be at a level per user which will make it feasible for user agencies or local or state governments to support them financially. (ACSCI; CIS; NOICC; NGT)

1. The system component cost, including estimated per user costs, should be described. (ACSCI)
2. The pricing schedule should be developed. (ACSCI)
3. User agencies should be consulted in determining new fee schedules. (ACSCI)

Standard XVII.* The state system should have a staff member responsible for supervising and available for consultation by user agencies concerning the delivery system. (ACSCI; NOICC)

*Implementation criteria; not used in choosing a system.

Standard XVIII. The system should be adoptable for effective use in a variety of locales and with users having different needs. (CIS; NOICC; NGT)

1. The system should provide the means for integrating the information with interests, values and abilities. (CIS; NOICC; NGT)
2. The system should permit use both for career exploration as well as for career decision-making. (CIS; NOICC; NGT)
3. The system should provide interesting and legible summary copies for future reference by users. (CIS; NOICC; NGT)
4. The system should be expandable and capable of being easily updated. (NGT)
5. The system should be capable of being tailored to local needs. (NGT)

Standard XIX. The system should contain a guidance model which is appropriate for a large variety of settings in order to satisfy client needs.

1. The system should measure occupational interests and aptitudes with instruments such as the USES interest inventory and the GATB. (NGT)
2. The system should allow for the administration and interpretation of these instruments online.

Standard XX. The system should be flexible.

1. New developments should not require major system modification.
2. The system should be capable of being upgraded.
3. The system should be able to operate using a variety of

teleprocessing techniques.

4. The system should be able to operate on existing hardware.
5. There should be a high level of vendor independence.

6.2.4 Marketing and User Services*

Standard I. A marketing plan should be developed and followed. (ACSCI; NGT

1. The population being served should be identified. (ACSCI)
2. Key people/agencies should be identified. (ACSCI)
3. Procedures for marketing should be spelled out. (ACSCI)
4. Rate structures should be identified. (ACSCI)
5. Computer access capabilities and services should be identified. (ACSCI)

Standard II. Promotion of additional user sites should be an on-going function. (ACSCI)

1. Promotional materials should be available. (ACSCI)
2. Contacts should be made systematically. (ACSCI)
3. Referrals should be followed up in a reasonable period of time. (ACSCI)
4. Demonstrations should be conducted as needed. (ACSCI)
5. Special assistance should be provided with terminal hook-up. (ACSCI)
6. Follow-up demonstrations and explanations should be provided. (ACSCI)
7. Demonstration time should be provided. (ACSCI)
8. Research should be done to identify different types of potential users. (ACSCI)
9. Records should be kept on referrals and demonstrations. (ACSCI)

*Implementation criteria; not used in choosing a system.

Standard III. Public information should be available in concise, accurate and effective form.

1. Materials for general distribution should be available which describe the systems. (ACSCI)
2. Public information releases/newsletters, etc. should be circulated and in evidence. (ACSCI)
3. Definite activities should be carried on in the public relations field. (ACSCI)

Standard IV. User materials should be well-designed, easily-used, appealing to users and readily available. (ACSCI)

1. Users should be able to easily understand the materials. (ACSCI)
2. Materials should be readily available in appropriate quantities. (ACSCI)
3. The reading level should be appropriate to the audience. (ACSCI; NGT)
4. Materials should be designed to promote interest and use. (ACSCI)

Standard V. Training for use of the system should be provided. (ACSCI; NOICC; NGT)

1. A training program for effective utilization of career information should be in evidence. (NGT)
2. All new users should be promptly and properly trained. (ACSCI)
3. Inservice for all users should be held annually and whenever system updates and modifications are made. (ACSCI; NGT)
4. User problems should be handled promptly. (ACSCI)
5. New items or changes in system/information should be appropriately communicated to users. (ACSCI)

6. Evidence should exist that system use problems are corrected properly. (ACSCI)
7. Users should be oriented to the kinds and amount of information clients can effectively absorb in a single session.

Standard VI. Users should not only be trained in the use of the system, but also be aware of system weaknesses and limitations.

1. Users should be oriented to weaknesses, limitations, strengths and benefits of the system so that they can effectively counsel clients who use the system.
2. The system should be primarily user-operated and should make clients aware of its limitations.
3. It should be clear from the system output that its information is not absolute fact, but rather generalizations, judgments and inferences.

Standard VII. A system of communication between marketing staff and users should be in effect. (ACSCI; CIS; NOICC)

1. Determining information needs should be an ongoing process. (NGT)
2. A newsletter or other communications device should be effectively employed. (ACSCI; CIS)
3. Provisions should be made for user feedback over and above annual evaluation. (ACSCI; CIS; NGT)
4. Records should be kept of user problems and feedback.

Standard VIII. The system should be available to all clients/students during their regular day. (ACSCI; CIS; NOICC; NGT)

Standard IX. The delivery system should be available as part of the counseling and instructional process and also be available for independent client use. (ACSCI; CIS; NOICC; NGT)

1. There should be evidence that the delivery system is integrated with counseling and instructional programs of the user agencies. (ACSCI; CIS; NGT)
2. Independent client usage should also be fostered. (ACSCI; CIS)
3. All information should be available to all users in a reasonable period of time. (ACSCI; CIS; NGT)
4. A user summary profile should be available for counselors.
5. A counselor should be available for consultation with clients. (NGT)

Standard X. A coordinator of user services should be identified on each user site with these duties: marketing of the system, demonstration, inservice training, contract negotiations, public relations. (ACSCI; NOICC)

1. There should be a list of coordinator names and addresses. (ACSCI)
2. Tasks and responsibilities should be identified for the coordinators. (ACSCI)
3. There should be a plan for coordinator training.

Standard XI. Training in information development and user services techniques will be needed to develop a career information system staff. (NOICC)

1. For information analysts, training would include practical techniques for locating, obtaining, appraising, analyzing, synthesizing and presenting occupationally related informational sources, published and unpublished and from interviews. (CIS; NOICC)

2. For user services staff, training should emphasize the development of skills necessary to explain and publicize CIDS services and to provide training to user agency staff, such as counselors, teachers and administrators. (CIS; NOICC)

6.2.5 System Finance*

Standard I. Financial planning should be conducted. (NGT)

1. The sources for operating funds should be described.
2. If the initial development is funded through grants, this outside funding should be investigated to determine its level and duration.
3. State and local funding arrangements should be developed.
4. The system should have a fiscal agent. (ACSCI)
5. There should be a process for developing the budget. (ACSCI)
6. An audit should be conducted. When completed, the results should be shown. (ACSCI)
7. Management should be informed concerning financial status of the system. (ACSCI)

Standard II. The budget should be adequate to provide the services expected by the users.

1. Evidence should exist showing that funds available are adequate to operate the system. If funds are not currently adequate, plans should be underway to rectify the situation. (ACSCI)
2. The largest financial supporters of the system should be listed. The percent of the budget each provides should be shown. All groups which support users should be listed. Each reliable source of funding should be listed.

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*Implementation criteria; not used in choosing a system.

Standard III. Before selecting a system, the potential costs of that system should be determined. (CIS; NOICC)

1. The cost of the system per site and per user should be determined.
2. It should be noted that costs may increase or decrease in the future.
3. It should be noted that there may be additional charges for the system as the system is upgraded.

Standard IV. The budget should be adequate to provide the services needed by the users. (NOICC)

1. The costs of a basic staff (serving two large SMSA's): one director, four or five occupational information analysts, two user services specialists, three clerical staff should be stated. (CIS; NOICC)
2. The costs involved in serving additional SMSA's should be stated. (CIS; NOICC)
3. Costs of gathering necessary information should be estimated. These will depend on the number and size of local areas for which information must be developed and user services provided, the occupational complexity of the state which determines the number of occupations that should be included in the information system and the number of supplementary files developed and ancillary services provided. (CIS; NOICC)

6.2.6 Evaluation*

Standard I. A career information delivery system should continually monitor and assess the system's use, impact and performance. (CIS; NOICC; NGT)

1. There should be an evaluation plan, as well as uses for evaluation data, in evidence. (ACSCI; NGT)
2. Both users and staff should be involved. (ACSCI)
3. Third-party persons should be involved in the evaluation. (ACSCI)

Standard II. Multiple criteria should be developed to assess system impact and performance.

1. Impact criteria should include:
   - general knowledge of occupations,
   - awareness of personally relevant occupations,
   - knowledge of occupational information sources,
   - people and institutions in the community which can help with occupational exploration and job placement,
   - some measure of seeking out vocational information on one's own. (CIS; NOICC)
2. Performance criteria should include:
   (a) System penetration in schools:
      - available to two-thirds of high school students within three to four years;
      - within each high school, there should be sufficient capacity to serve at least 80 percent of the students by the end of the second year;
      - the number of users of the system during a school year. (CIS; NOICC)

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*Implementation criteria; not used in choosing a system.

(b) System penetration in other user agencies:

- the number of different people in each user agency who use the system,
- the total number of users made of the system each year. (CIS; NOICC)

(c) Variety of users:

- various types of clients by academic program, sex, race, economic status, veteran status, academic ability and whether English is spoken as a second language. (CIS; NOICC; NGT)

(d) Ease of use:

- systematic collection of information concerning users' reactions. (CIS; NOICC; NGT)

(e) Integration with educational program:

- system becomes part of guidance program;
- teachers incorporate information from the system into career education curriculum. (CIS; NOICC; NGT)

(f) Costs:

- user agency keeps account of annual cost per user. (CIS; NOICC)

Standard III. Career information delivery system developers may wish to conduct longitudinal evaluation studies which compare the labor market success or experience of clients who used the system with those who did not. (CIS; NOICC)

Standard IV. (a) A system research and development effort is in place, with adequate resources allocated, to ensure that the delivery system keeps up with the technological improvements in the field. (ACSCI)

(b) The system should make adequate research and development resources available for design, pilot-testing and evaluation as well as implementation of improvements. (ACSCI)

6.3 Process of Weighting Criteria

6.3.1 Introduction

Evaluation of the vendor systems requires quantitative comparisons among them. These comparisons must also reflect Illinois user needs, so it was necessary to construct an analytical model incorporating them as criteria. Then, the problem was to create a weighted set of criteria which describes an ideal career information delivery system in a systematic and effective manner. One appropriate model is a weighted checklist, which expresses the value of a system as:

$$\text{Value} = w_1x_1 + w_2x_2 + w_3x_3 + \ldots + w_nx_n,$$

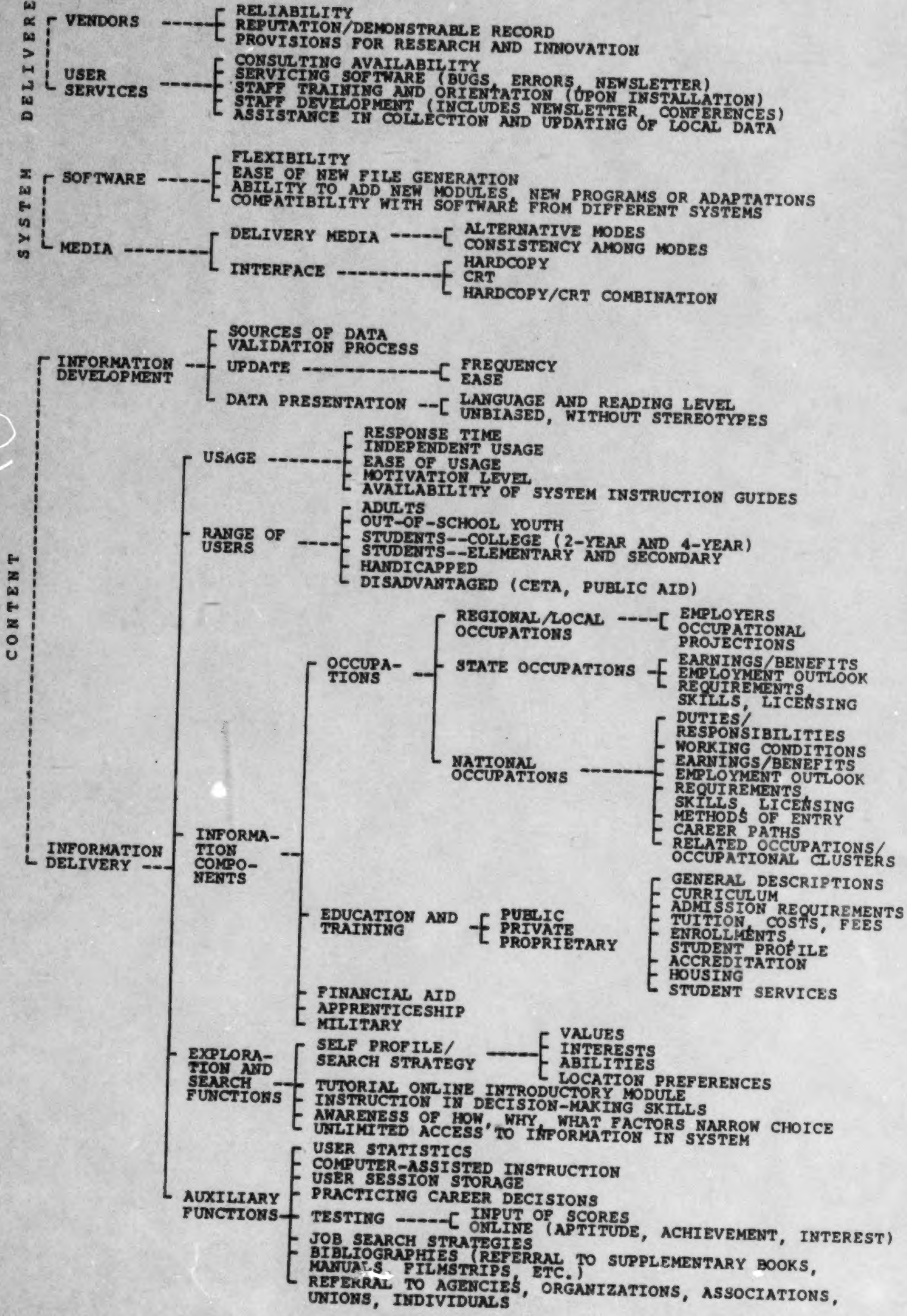
where each w_i is the weight for criterion i and x_i is the level to which the vendor system meets criterion i. The weight for each criterion reflects the importance of that criterion and, therefore, of the corresponding user need.

Due to the very large number of criteria and the corresponding difficulty of assigning weights, the weighted checklist was converted into an equivalent criteria tree (see chart in Section 6.3.2), which allows the criteria to be grouped into sub-criteria and sub-sub-criteria, etc. The weights were assigned by the CIPAC at the July 23rd meeting.

6.3.2 Criteria Tree and Glossary

The following chart presents the criteria used in evaluating the vendor systems. Next, the glossary provides a definition for each criterion, except where completely self-explanatory. In some instances an example or illustration is offered to amplify the meaning.

CRITERIA TREE



- DELIVERER
  - VENDORS
    - RELIABILITY
    - REPUTATION/DEMONSTRABLE RECORD
    - PROVISIONS FOR RESEARCH AND INNOVATION
  - USER SERVICES
    - CONSULTING AVAILABILITY
    - SERVICING SOFTWARE (BUGS, ERRORS, NEWSLETTER)
    - STAFF TRAINING AND ORIENTATION (UPON INSTALLATION)
    - STAFF DEVELOPMENT (INCLUDES NEWSLETTER, CONFERENCES)
    - ASSISTANCE IN COLLECTION AND UPDATING OF LOCAL DATA
- SYSTEM
  - SOFTWARE
    - FLEXIBILITY
    - EASE OF NEW FILE GENERATION
    - ABILITY TO ADD NEW MODULES, NEW PROGRAMS OR ADAPTATIONS
    - COMPATIBILITY WITH SOFTWARE FROM DIFFERENT SYSTEMS
  - MEDIA
    - DELIVERY MEDIA
      - ALTERNATIVE MODES
      - CONSISTENCY AMONG MODES
    - INTERFACE
      - HARDCOPY
      - CRT
      - HARDCOPY/CRT COMBINATION
- CONTENT
  - INFORMATION DEVELOPMENT
    - SOURCES OF DATA
    - VALIDATION PROCESS
    - UPDATE
      - FREQUENCY
      - EASE
    - DATA PRESENTATION
      - LANGUAGE AND READING LEVEL
      - UNBIASED, WITHOUT STEREOTYPES
  - INFORMATION DELIVERY
    - USAGE
      - RESPONSE TIME
      - INDEPENDENT USAGE
      - EASE OF USAGE
      - MOTIVATION LEVEL
      - AVAILABILITY OF SYSTEM INSTRUCTION GUIDES
    - RANGE OF USERS
      - ADULTS
      - OUT-OF-SCHOOL YOUTH
      - STUDENTS--COLLEGE (2-YEAR AND 4-YEAR)
      - STUDENTS--ELEMENTARY AND SECONDARY
      - HANDICAPPED
      - DISADVANTAGED (CETA, PUBLIC AID)
    - INFORMATION COMPONENTS
      - OCCUPATIONS
        - REGIONAL/LOCAL OCCUPATIONS
          - EMPLOYERS
          - OCCUPATIONAL PROJECTIONS
        - STATE OCCUPATIONS
          - EARNINGS/BENEFITS
          - EMPLOYMENT OUTLOOK
          - REQUIREMENTS
          - SKILLS, LICENSING
        - NATIONAL OCCUPATIONS
          - DUTIES/RESPONSIBILITIES
          - WORKING CONDITIONS
          - EARNINGS/BENEFITS
          - EMPLOYMENT OUTLOOK
          - REQUIREMENTS
          - SKILLS, LICENSING
          - METHODS OF ENTRY
          - CAREER PATHS
          - RELATED OCCUPATIONS/OCCUPATIONAL CLUSTERS
      - EDUCATION AND TRAINING
        - PUBLIC
        - PRIVATE
        - PROPRIETARY
          - GENERAL DESCRIPTIONS
          - CURRICULUM
          - ADMISSION REQUIREMENTS
          - TUITION, COSTS, FEES
          - ENROLLMENTS
          - STUDENT PROFILE
          - ACCREDITATION
          - HOUSING
          - STUDENT SERVICES
      - FINANCIAL AID
      - APPRENTICESHIP
      - MILITARY
    - EXPLORATION AND SEARCH FUNCTIONS
      - SELF PROFILE/SEARCH STRATEGY
        - VALUES
        - INTERESTS
        - ABILITIES
        - LOCATION PREFERENCES
      - TUTORIAL ONLINE INTRODUCTORY MODULE
      - INSTRUCTION IN DECISION-MAKING SKILLS
      - AWARENESS OF HOW, WHY, WHAT FACTORS NARROW CHOICE
      - UNLIMITED ACCESS TO INFORMATION IN SYSTEM
    - AUXILIARY FUNCTIONS
      - USER STATISTICS
      - COMPUTER-ASSISTED INSTRUCTION
      - USER SESSION STORAGE
      - PRACTICING CAREER DECISIONS
      - TESTING
        - INPUT OF SCORES
        - ONLINE (APTITUDE, ACHIEVEMENT, INTEREST)
      - JOB SEARCH STRATEGIES
      - BIBLIOGRAPHIES (REFERRAL TO SUPPLEMENTARY BOOKS, MANUALS, FILMSTRIPS, ETC.)
      - REFERRAL TO AGENCIES, ORGANIZATIONS, ASSOCIATIONS, UNIONS, INDIVIDUALS

VENDORS

- reliability: refers to the history, size, credibility and viability of the vendor organization. Are they likely to stay in business? Are they likely to continue to support the system?
- reputation and demonstrable record: applies to vendor's record of service to past and current users and to evaluation studies conducted to assess effectiveness.
- provisions for research and innovation: of concern are efforts conducted under the auspices of the vendor to improve and upgrade the program. Are there any indications that research is or will be undertaken? Does the vendor support the product and plan to develop it further?

USER SERVICES

- consulting availability: considers the desirability of having consulting services available from vendor.
- servicing software: includes software reliability studies, help in smoothing out bugs and errors in the program; may include a newsletter or periodic correspondence regarding system features, maintenance, operational or functional issues.
- staff training and orientation: refers to the training of user services and information analysis staff at time of purchase and innovation; training of counselors at new user agencies, such as high school counselors.
- staff development: involves an ongoing process of educating and informing staff concerning new developments and concepts; may include newsletter, conferences and workshops.
- assistance in collection and updating of local data: refers to file and data collection instrument design, collection, proofreading and loading of data, identification of sources.

SOFTWARE

- flexibility: refers to the ability to run on different computers. Examples: IBM, CDC, UNIVAC, or mini-computers PDP-11, HP 3000 or combinations of these. (Considerations are of time/effort necessary to adapt to different hardware.)
- ease of new file generation: overtime new information files need to be added. Example: local job or school data file might need to be created. Concerns relate to how easily this can be done: online or requiring substantial reprogramming. The time can be a few hours or several weeks.
- ability to add new modules, programs or perform adaptations: refers to ease of integrating new programs or adapting current ones. Example: one vendor has developed a computer language for creating new modules or changing text. Some programs can require a major reprogramming effort for modifications or may not allow changes under any circumstances.
- compatibility with software from different systems: refers to ease of combining system with other systems. It might be advantageous to cross-link, coincide or merge systems.

- MEDIA
  - delivery media:
    - alternative modes: microfiche, audio-visual, needlesort, etc.
    - consistency among modes: refers to consistency of format between and among alternative modes.
  - interface:
    - hardcopy: refers to printout or printed material user takes home.
    - CRT: refers to cathode ray tube.
    - hardcopy/CRT combination

- INFORMATION DEVELOPMENT
  - sources of data: refers to the sources used by the vendor for reference in creating information and/or guidance files. Certain sources of data may be considered more accurate or detailed. Example: some vendors use an association's survey of schools in their school file; others collect information about schools themselves.
  - validation process: refers to the reliability of data over time. Prepared data may be shown to knowledgeable persons for clarification or verification. Example: information regarding an occupation may be shown to several practitioners for analysis and response.
  - update:
    - frequency: refers to the expectation that data will be updated on a continuous basis appropriate to file. Concerns relate to how often data is updated--annually, semi-annually or based on what other schedule.
    - ease: refers to process of updating. Files may be quickly updated online, or a complex program may have to be run. System may have to be shut down for an update for several hours.
  - data presentation:
    - language and reading level: refers to the appropriateness to the user of the language and vocabulary.
    - unbiased and without stereotypes: means that narratives should be without cultural, racial, ethnic and sexual biases.

- INFORMATION DELIVERY
  - usage:
    - response time: batch vs. online. Consideration of response time should be viewed separately. Batch response refers to time between completion of questionnaire and receipt of printout. Online response is time until information appears on console after hitting "enter".
    - independent usage: refers to the degree to which a student or client can run the system without assistance.
    - ease of usage: refers to the degree of reliance on auxiliary materials to run the system. Example: some systems require switching between different media in one session, e.g., manuals and CRT. Other systems explain and provide operating instructions on the CRT.

INFORMATION DELIVERY (cont'd)

- usage: (cont'd)
  - motivation level: refers to the expectation that a system will stimulate interest and attention of the user. Example: the client or student will be motivated to complete a module and to go on to another and also return for additional information or guidance.
  - availability of system instruction guides: most vendors supply booklets or brochures for the user or detailed manuals for the counselor.
- range of users:
  - adults
  - out-of-school youth
  - students-college (2 and 4 year)
  - students-elementary and secondary
  - handicapped
  - disadvantaged (CETA, Public Aid)
- information components:
  - occupations*
    - regional and local occupations:
      - employers--lists of major employers in area
      - occupational projections--information concerning local employment outlook; occupation specific
    - state occupations:
      - earnings/benefits
      - employment outlook
      - requirements, skills, licensing
    - national occupations:
      - duties/responsibilities
      - working conditions
      - earnings/benefits
      - employment outlook
      - requirements, skills, licensing
      - methods of entry
      - career ladders - paths
      - related occupations/occupational clusters

*state and regional/local occupational descriptions add indicated data to information provided for national occupations

INFORMATION DELIVERY (cont'd)

- information components (cont'd)
  - education and training:
    - public
    - private
    - proprietary
      - general description
      - curriculum
      - admission requirements
      - tuition, costs, fees
      - enrollment, student profile
      - accreditation
      - housing
      - student services
  - financial aid: how to get financial aid; lists of loans, scholarships, etc. Lists of organizations distributing aid.
  - apprenticeship
  - military: jobs, conditions, requirements, duties
- exploration and search functions:
  - self profile/search strategy: refers to a system's capacity to match personal information and occupational characteristics. Example: mechanical aptitude and interest results in the addition of mechanic to occupations list.
    - values
    - interests
    - abilities
    - location preferences
  - tutorial online introductory module: refers to the inclusion of material which teaches the user how to use the system.
  - instruction in decision-making skills: refers to inclusion of material which assists the client or student though the process of making career choices.
  - awareness of how, why, what factors narrow choice: "What if?" type questions. "What choices limit occupations?" list. Example: A user may ask why a certain occupation did not appear on an occupations list.
  - unlimited access to information in system: refers to the expectation that users will be able to access any information in the system.

INFORMATION
DELIVERY
(cont'd)

- auxiliary functions:
  - user statistics: refers to the capacity to provide data regarding the system's users. Example: the number of users on any given day, the number of times each file or occupation is accessed in a given period.
  - computer-assisted instruction: refers to the capability for online instruction in a number of topics not necessarily related to career information.
  - user session storage: refers to the capability of storing usage information for a specific client to be retrieved for the next session. May allow a user to start at the stage previously left.
  - practicing career decisions: refers to exercises illustrating key decisions that lead to entry into a given occupation. This may include simulation of career paths.
  - testing:
    - input of scores: SAT, GATB, etc.
    - online: aptitude, achievement, interest tests conducted online. Example: some systems help user to match interests and abilities by inputting test results; other systems offer tests online.
  - job search strategies: refers to modules which offer information and assistance regarding the job search process: information on locating job openings, resume preparations, interviews.
  - bibliographies: refers to references at appropriate points to supplementary books, manuals, filmstrips, etc.
  - referral to agencies, organizations, associations, unions, individuals: refers to related support services, resources for counseling, guidance, organizations and individuals who have agreed to provide additional data.

6.3.3 Criteria Weighting by CIPAC

As stated in Section 6.3.1, an analytical model which reflected Illinois user needs was needed to evaluate the vendor systems. Once this model was developed, a weight needed to be assigned to each criterion.

Given the role of CIPAC as a representative decision-making body, it was decided that the voting members of CIPAC would take responsibility for assigning the criteria weights.

Each voting CIPAC member allocated 100 points to each criteria set, beginning at the lowest level. The average weight was computed for each criterion and this became the final weight.

The CIDS Project Staff had also developed a set of criteria weights, based on the interviews, questionnaires and workshop results. There was very little difference in the two sets and the CIPAC weights were adopted as the final set.

The criteria tree on the next page includes the CIPAC-assigned weights.

CRITERIA TREE

- DELIVERER 19.7
  - VENDORS 35.5
    - RELIABILITY 40.6
    - REPUTATION/DEMONSTRABLE RECORD 35.0
    - PROVISIONS FOR RESEARCH AND INNOVATION 24.4
  - USER SERVICES 64.5
    - CONSULTING AVAILABILITY 15.0
    - SERVICING SOFTWARE (BUGS, ERRORS, NEWSLETTER) 30.6
    - STAFF TRAINING AND ORIENTATION (UPON INSTALLATION) 23.3
    - STAFF DEVELOPMENT (INCLUDES NEWSLETTER, CONFERENCES) 13.3
    - ASSISTANCE IN COLLECTION AND UPDATING OF LOCAL DATA 17.8
- SYSTEM 31.3
  - SOFTWARE 56.0
    - FLEXIBILITY 24.4
    - EASE OF NEW FILE GENERATION 25.6
    - ABILITY TO ADD NEW MODULES, NEW PROGRAMS OR ADAPTATIONS 21.1
    - COMPATIBILITY WITH SOFTWARE FROM DIFFERENT SYSTEMS 28.9
  - MEDIA 44.0
    - DELIVERY MEDIA 42.2
      - ALTERNATIVE MODES 47.2
      - CONSISTENCY AMONG MODES 52.8
    - INTERFACE 57.8
      - HARDCOPY 20.0
      - CRT 7.8
      - HARDCOPY/CRT COMBINATION 72.2
- CONTENT 49.0
  - INFORMATION DEVELOPMENT 36.5
    - SOURCES OF DATA 25.3
    - VALIDATION PROCESS 21.2
    - UPDATE 30.4
      - FREQUENCY 58.9
      - EASE 41.1
    - DATA PRESENTATION 23.1
      - LANGUAGE AND READING LEVEL 68.3
      - UNBIASED, WITHOUT STEREOTYPES 31.7
  - INFORMATION DELIVERY 63.5
    - USAGE 19.4
      - RESPONSE TIME 26.1
      - INDEPENDENT USAGE 17.7
      - EASE OF USAGE 25.6
      - MOTIVATION LEVEL 18.9
      - AVAILABILITY OF SYSTEM INSTRUCTION GUIDES 11.7
    - RANGE OF USERS 20.6
      - ADULTS 12.0
      - OUT-OF-SCHOOL YOUTH 15.2
      - STUDENTS--COLLEGE (2-YEAR AND 4-YEAR) 14.0
      - STUDENTS--ELEMENTARY AND SECONDARY 22.1
      - HANDICAPPED 13.9
      - DISADVANTAGED (CETA, PUBLIC AID) 22.8
    - INFORMATION COMPONENTS 33.9
      - OCCUPATIONS 38.4
        - REGIONAL/LOCAL OCCUPATIONS 48.0
          - EMPLOYERS 46.5
          - OCCUPATIONAL PROJECTIONS 53.5
        - STATE OCCUPATIONS 34.0
          - EARNINGS/BENEFITS 2[illegible].5
          - EMPLOYMENT OUTLOOK 40.0
          - REQUIREMENTS, SKILLS, LICENSING 31.5
        - NATIONAL OCCUPATIONS 18.0
          - DUTIES/RESPONSIBILITIES 20.8
          - WORKING CONDITIONS 11.7
          - EARNINGS/BENEFITS 8.7
          - EMPLOYMENT OUTLOOK 14.8
          - REQUIREMENTS, SKILLS, LICENSING 17.3
          - METHODS OF ENTRY 10.8
          - CAREER PATHS 7.7
          - RELATED OCCUPATIONS/OCCUPATIONAL CLUSTERS 8.2
      - EDUCATION AND TRAINING 32.2
        - PUBLIC 48.8
        - PRIVATE 31.8
        - PROPRIETARY 19.3
          - GENERAL DESCRIPTIONS 9.6
          - CURRICULUM 24.0
          - ADMISSION REQUIREMENTS 21.
          - TUITION, COSTS, FEES 21.5
          - ENROLLMENTS, STUDENT PROFILE 4.8
          - ACCREDITATION 7.0
          - HOUSING 5.3
          - STUDENT SERVICES 6.3
      - FINANCIAL AID 14.9
      - APPRENTICESHIP 7.6
      - MILITARY 6.9
    - EXPLORATION AND SEARCH FUNCTIONS 15.6
      - SELF PROFILE/SEARCH STRATEGY 26.0
        - VALUES 19.2
        - INTERESTS 29.5
        - ABILITIES 32.0
        - LOCATION PREFERENCES 19.3
      - TUTORIAL ONLINE INTRODUCTORY MODULE 11.5
      - INSTRUCTION IN DECISION-MAKING SKILLS 20.5
      - AWARENESS OF HOW, WHY, WHAT FACTORS NARROW CHOICE 18.5
      - UNLIMITED ACCESS TO INFORMATION IN SYSTEM 23.5
    - AUXILIARY FUNCTIONS 10.5
      - USER STATISTICS 9.0
      - COMPUTER-ASSISTED INSTRUCTION 12.0
      - USER SESSION STORAGE 5.0
      - PRACTICING CAREER DECISIONS 19.0
      - TESTING 12.2
        - INPUT OF SCORES 55.5
        - ONLINE (APTITUDE, ACHIEVEMENT, INTEREST) 44.
      - JOB SEARCH STRATEGIES 15.0
      - BIBLIOGRAPHIES (REFERRAL TO SUPPLEMENTARY BOOKS, MANUALS, FILMSTRIPS, ETC.) 10.8
      - REFERRAL TO AGENCIES, ORGANIZATIONS, ASSOCIATIONS, UNIONS, INDIVIDUALS 17.0

References

Association of Computer-Based Systems for Career Information. Proposed standards and self-evaluation guides for system assessment. No date.

National Occupational Information Coordinating Committee. Career information delivery systems: A position paper on organization and development. Washington, D.C.: NOICC, 1979.

U.S. Department of Labor, Employment and Training Administration. Career information systems: Standards for organization and development. Washington, D.C.: U.S. Government Printing Office, 1977.

7.0 Recommendations

7.1 Introduction

This section deals primarily with CIDS Feasibility Study staff recommendations regarding the selection of a vendor system. Included in Section 7.2 is a Ranked Vendor List which displays the systems as they were ranked using CIPAC weights. The criteria weights as determined by CIPAC are shown on the Criteria Tree (See Section 6). Included in this section is a summary chart which capsulizes the data concerning the three recommended systems.

In order to illustrate the relative merits of each system considered, Section 7.3 presents a matrix which relates each criterion (from the Criteria Tree) to each system. AEL is not depicted because it is a print media system and the Tree relates only to computer-based systems. The matrix provides the rationale for the three systems recommended. A cost schedule is included, but all figures are to be understood as approximations. Stated costs tend to be misleading because training and consulting fees are inexact. Costs for the collection and processing of Illinois-specific data cannot be calculated with precision. Also the number of users cannot be accurately projected. Only relative costs can be determined from the cost estimates.

The CIDS Feasibility Study staff recommended to the CIPAC committee on August 28, 1980, the following three vendor systems:

DISCOVER

CHOICES

CIS

Subsequent to this recommendation, CHOICES underwent a major vendor operational change. At the time the Illinois study concluded, CHOICES had switched from DMR & Associates to Canadian Systems Group (CSG). Costs and terms of purchase previously indicated in this report represent DMR policy and are subject to revision under CSG. As a consequence of this vendor shift, CHOICES was dropped from final consideration.

It is now the conclusion of the Illinois CIDS Feasibility Study staff that DISCOVER be selected as the statewide system and be delivered through the OMIC computer network (See Section 4 for description). DISCOVER's national data files enable a statewide system to be implemented almost immediately. Illinois specific data would be collected, formated and added to the system as ready (approximately 6-8 months). With OMIC established as the primary delivery mechanism, it is further recommended that a version of DISCOVER be adapted to PLATO, integrating computer-based guidance and information with computer-assisted instruction. Once this conversion is accomplished, the state will be served by two complementary delivery networks. Additionally, a DISCOVER conversion might be made for the ECN network (See Section 4). All three networks have indicated capacity and willingness to serve as part of an Illinois CIDS.

The expectation is that the two conversions would be made while the Illinois specific data is being prepared and that the adapted PLATO and ECN versions would be initiated with Illinois occupational and educational data.

It should be noted that CIS can also be adapted for PLATO and is already compatible with OMIC and ECN. Start up would be delayed in that CIS does not have national data files. An Illinois CIDS using the CIS system could not be in place until Illinois data has been entered into the Oregon system.

7.2 Ranked List

The results of the ranking with CIPAC weights is as follows:

1. DISCOVER
2. EXPLORE
3. CIS
4. GIS
5. CHOICES
6. COIN
7. SIGI
8. CVIS
9. VIP
10. AEL

Systems dropped from consideration:

- ECES software and support documentation is not available.
- SCAD is undergoing redesign and is not available.
- SEARCH is a product of an Oregon state agency and is not available.
- VOCOMP is directed at vocational rehabilitation settings and is not suitable for a statewide CIDS.

The list on the preceding page presents the results of the vendor system evaluation.

The process of evaluating the vendor systems consisted of three major components:

- Assign criteria weights (see Section 6.3.3)
- Rate each system on each criterion
- Apply weights to each score for each criterion

Rating of each system on each criterion was done by all project staff members who had investigated the systems. All systems were rated on one criterion at a time. Each score was the result of group consensus.

Several systems were dropped from consideration before this stage was begun: ECES, SCAD, SEARCH, VOCOMP. The reason for each is noted on the ranked list.

The systems were scored on a five-point scale, with 0 = do not recommend, based on this criterion alone; 1 = prediction poor; 2 = indifferent; 3 = prediction good; 4 = recommend system, based on this criterion alone.

Once the scoring was completed, the score for each system for each criterion was multiplied by the weight assigned for that criterion. Next, the weighted scores were summed for each system. The resultant ranking is presented in the ranked list.

SUMMARY

SYSTEM	Distinguishing Features	Users	Costs	Deliverables
DISCOVER	• Easy access, all directions are on CRT • Comprehensive guidance and information features; user can proceed through modules (approx. 7 hours) or access specific information directly • Two versions--secondary and college/adult • Job search strategy module • Retention of user information • User ability to practice career decision-making • 422 occupational descriptions • FrameBuilder language offers high degree of flexibility and state independence • Ability to get statewide system started quickly	• Secondary Schools • Community Colleges • 4-yr. Colleges • Public Libraries • Area Career/Voc. Centers • Military Educ. Centers • Adults	$1000 per month per mainframe for 24 months (DISCOVER Found.) $1250 per month per mainframe for 24 months (IBM) $1500 annual update tapes per mainframe $1300-1500 approx. for training	• Systems Installation • In-Service Training • Student Orientation Materials • Local Files Operations Manual • Data Base management Operations Manual • Maintenance of program, text and data files
CHOICES	• Four routes to access system: EXPLORE, SPECIFIC, COMPARE, RELATED • Occupations in SOC codes • Compare feature for occupations and schools--up to 3 at a time • Counselor summary print-out • Consortium of state systems to share cost and effort of enhancements • 1,100 primary Canadian occupations; 3,200 similar occupations	• Secondary Schools (also Middle Schools) • Colleges • CETA • Employment Service	$1000 one time fee $200 (approx.) School Program Tape from N. Carolina Training Costs Approx. $20000	• Tape containing functional CHOICES system (North Carolina enhancement • Documentation to rende system operational
CIS	• Linked system; no dead ends • QUEST access strategy--match interests, aptitudes and preferences to occup. • 300 word occupational descriptions • Preparation File--statement for each occupation in system, skills needed, licensing requirements, cross references to appropriate post-secondary education/training • Compare feature for schools • Ability to use Strong-Campbell with CIS • Users group for collective system development • 249 occupations • Two modes of delivery (computer and needlesort)	• Secondary Schools • Community Colleges • 4-yr. Colleges • CETA (Prime sponsors and subgrantees) • Correctional Inst.	$7000 First language version (one time) charge $1000 Annual maintenance fee each version	• Basic Software and Training Materials • Occupational File development • Educ. File development • Attribute Code Trainin • Occup. File Maintenanc

7.3 Support for Recommendations

7.3.1 Matrix: Systems by Criteria

The matrix on the following pages relates each system to the criteria tree. Each vendor was asked to validate the information and all vendors but COIN responded. Modifications suggested by vendors and other sources were incorporated into the matrix.

	Vendor/Developer	Reputation/Demonstrable Record
CHOICES	developed by Phillip S. Jarvis, Canadian government, marketed by DMR and CSG	in flux, operating in two states
CIS	developed by Dr. Bruce McKinlay and staff at University of Oregon Research Center	stable, statewide in thirteen states and one large city
COIN	developed by Dr. Rodney H. Durgin, marketed by Ideal Systems	stable, operating in several locations and one state
CVIS	developed by Dr. JoAnn Harris-Bowlsbey, marketed by CVIS Distribution Center for the CVIS Consortium, Inc.	stable, operating in many locations, several in Illinois
DISCOVER	developed by Dr. JoAnn Harris-Bowlsbey, marketed by IBM and DISCOVER Foundation	stable, operating in many locations, one in Illinois, recently chosen as Vermont CIDS.
EXPLORE	developed by Dr. JoAnn Harris-Bowlsbey for Towson State University	unknown, newly-developed system
GIS	originally created by Dr. David Tiedeman, developed and marketed by TimeShare Corporation	stable, statewide in fourteen states with state data, operating in 46 states total, 100 Illinois sites
SIGI	developed by Dr. Martin Katz and marketed by Educational Testing Service	stable, operating in many locations, including 60 colleges, several in Illinois
VIP	developed by John Cripe at Joliet Junior College	stable, operating in many locations throughout Illinois.

	Provisions for Research and Innovations	Availability of Consultants	Servicing Software
CHOICES	uncertain, appears as if U.S. innovations will be accomplished by consortium of states; studies available through Canadian gov't; $1 million being spent on innovations in Canada this year--available to U.S. users for the cost of re-producing tapes, documentation and handling	contracted through DMR	provided by DMR
CIS	developing national school file, investigating microcomputer delivery, investigating elementary school career package, studies have been conducted	contracted through CIS	contracted through CIS
COIN	developing microcomputer delivery, outgrowth of Michigan system	minimal, technical services to be subcontracted	contracted through Ideal Systems
CVIS	combined CVIS/DISCOVER Consortium for developing and disseminating innovations, studies have been conducted	will be available through CVIS Consortium, Inc.	contracted through CVIS Consortium, Inc.
DISCOVER	supported by DISCOVER Foundation for maintenance and new development, studies have been conducted, investigating microcomputer delivery system	contracted through DISCOVER Foundation	contracted through IBM and/ or DISCOVER Foundation
EXPLORE	none at this time	available through Sigmar, Inc. and DISCOVER Foundation	will be availabl through Sigmar, Inc. and DISCOVE Foundation
GIS	developing microcomputer delivery system, linkages to SOC classification	contracted through TSC	contracted through TSC
SIGI	individual sites can add specific program information, evaluation studies have been conducted, validity of prediction model demonstrated, adding an adult version and microcomputer delivery system	direct consulting on installation provided, otherwise contracted through ETS	contracted through ETS
VIP	batch program as outgrowth of CVIS	yes, through VIP	yes, through VIP

	Staff training and orientation	Staff development	Assistance in collection and updating of local data
CHOICES	through DMR	through DMR	minimal
CIS	extensive technical assistance available through CIS	periodic user group meetings and workshops	contract through CIS to develop files or to train Illinois staff to develop files; extensive programs
COIN	to be contracted	to be contracted	minimal
CVIS	will be available through the CVIS Consortium, Inc.	through the CVIS Consortium, Inc.	minimal
DISCOVER	through DISCOVER Foundation	through DISCOVER Foundation	minimal
EXPLORE	will be available through Sigmar, Inc. and DISCOVER Foundation	probably will be available	probably minimal
GIS	contracted through TSC	can be done by client or contracted through TSC	TSC will assist in collection and updating of local data for a fee; client may also update data.
SIGI	contracted through ETS	contracted through ETS	none for occupations, provide manuals and worksheets for local prediction and planning system for curriculum, financial aid, etc.
VIP	yes, through VIP	yes, through VIP	already collects Illinois data

	Flexibility (see also Section 3.5)	Ease of new file Generation	Ability to add new modules	Compatibility with software from different systems
CHOICES	runs on two large mainframes	requires programming effort	requires some programming effort	unknown
CIS	runs on several mainframes and minicomputers	requires minor programming effort	may require programming; can contract for design as needed	unknown
COIN	runs on several mainframes and minicomputers	local information can be added to national data	minimal	unknown
CVIS	runs on two large mainframes	relatively easy with author language, requires some programming and user-collected data	relatively easy, requires some programming effort using author language	unknown
DISCOVER	runs on one large IBM mainframe	relatively easy with the Frame-Builder author language	relatively easy with Frame-Builder	unknown
EXPLORE	runs on Hewlett-Packard 3000 Series III	local information can be added	requires programming effort	unknown
GIS	runs on several mainframes and minicomputers	contracted through TSC or can be done by client	requires programming effort	unknown
SIGI	runs on several mainframes and minicomputers	ETS will update from user data or ETS will provide user with frame editor program (prediction/planning only)	ETS discourages tampering with content of SIGI	unknown
VIP	runs on several computers	requires programming effort	requires programming effort	unknown

	Alternative modes	Consistency of modes	Hardcopy	CRT	CRT combination
CHOICES	none currently available, microfiche being developed	will be consistent	yes	yes	yes
CIS	needlesort and books or microfiche	compatible	users prefer hardcopy	yes	yes
COIN	microfiche	compatible	yes	yes	yes
CVIS	none	not applicable	yes	yes	yes
DISCOVER	complementary paper system being developed	will have high compatibility	yes, only as supplement to CRT	yes	yes
EXPLORE	complementary paper system	high compatibility	yes, as supplement to CRT or with HP CRT/printer combination	yes	yes
GIS	microfiche	compatible	yes	yes	yes
SIGI	none	not applicable	yes, only as supplement to CRT	yes	yes
VIP	none	not applicable	yes	available, not currently used	available, not currently used

	Sources of data	Validation process	Frequency and ease of update	Data presentation
CHOICES	DOT/SOC classifications	depends on installation	depends on installation	depends on installation
CIS	DOT, OOH, professional organizations, College Board	Oregon CIS has 5-7 member Review Panel to validate occupational descriptions. These may include employer, worker, educator, placement officer, expert observer.	utility programs, provided to update information in data base	depends on installation
COIN	DOL/BLS, own surveys of educational institutions	assumed by sources	annual updates from COIN	unknown
CVIS	ACT for college files, most other files from DISCOVER Foundation, Inc.	depends on installation	annual college updates, biannual occupational updates	jr. high school high school, community college versions
DISCOVER	OOH, DOL/BLS, Defense Dept. (for military files) APGA, ACT, NCES, ETS	assumed by sources	annual updates from DISCOVER Foundation	secondary and college/adult versions, reading level approx. 8.8 but varies by module
EXPLORE	same as DISCOVER	same as DISCOVER	same as DISCOVER	similar to DISCOVER
GIS	DOT, OOH, trade unions, professional organizations and businesses, Defense Dept., collects own school data	assumed by sources	annual updates from TSC	approx. 7th grade
SIGI	DOT, OOH, OOQ, BLS, professional organizations, labor unions, state agencies, college handbooks	expert observers and review panel validate information	annual updates from ETS	directed at those in or planning to enter postsecondary education
VIP	OOH, Defense Dept., local employer surveys, ACT, HEW	assumed by sources	career and military data every two years	unknown

	Response time	Independent usage	Ease of usage	level
CHOICES	installation dependent	medium degree	medium, need support materials	medium level
CIS	installation dependent	medium degree	medium, need support materials	medium level
COIN	installation dependent	medium degree	medium, need support materials	medium level
CVIS	installation dependent	high degree	high, little need of support materials	medium level
DISCOVER	installation dependent	high degree	high, little need for other materials	high level
EXPLORE	installation dependent	high degree	unknown at this time	unknown at this time
GIS	installation dependent	medium degree	medium, need support materials	medium level
SIGI	installation dependent	high degree	high, little need for support materials	high level as shown in evaluation studies
VIP	batch mode, overnight to several days	requires counselor	low, requires support materials	low level

	Availability of system instruction guides	Range of users
CHOICES	CHOICES Handbook, Counselor's Manual and travel guide available, other materials to be produced by installation	employment offices; CETA, some high schools and community colleges
CIS	user's implementation handbook and learning activities handbook available, other materials can be produced by installation	junior high and high schools; vocational/technical and community colleges; 4-year colleges; correctional institutions; CETA; vocational rehabilitation settings
COIN	handbook and profile sheets available	high schools; 2- and 4- year colleges; proposed settings include employment security and job service offices
CVIS	student and counselor manual and visuals available	high schools; 2- and 4-year colleges; CETA; 4H; correctional institutions; rehabilitation centers
DISCOVER	Tape-slide presentation, Counselor Professional Manual, Counselor In-service Training Manual, student handouts, Student Resource Guide, posters available	high schools; 2- and 4-year colleges; proposed settings include employment security and job sdrvice offices
EXPLORE	User Guide, Counselor Professional Manual	unknown
GIS	student handbooks available	high schools; middle schools; vocational/technical schools; CETA; corrections; 2- and 4-year colleges vocational rehab. settings; employment service; adult counseling centers
SIGI	counselor handbook, software support and installation guide, some user sites have own user orientation manual	2- and 4-year colleges; high schools; manpower offices; private counselors; employees in business and industry
VIP	counselor and student manual and questionnaires available	high schools; 2- and 4-year colleges; CETA; correctional institutions

	Regional/local occupations	State occupations
CHOICES	capacity for inputting additional required information components; working on adding Job Bank data online	North Carolina data available; Illinois data must be collected; N.C. SOC code conversion complete, FL SOC conversion available shortly
CIS	designed for local inputting; can add high schools, visit, summer jobs and employer files	Oregon and other states' data available; Illinois data must be collected
COIN	capacity for inputting; can add local wageload outlook data	data must be collected
CVIS	capacity for inputting	data must be collected
DISCOVER	local job files can be input through author language, Job Bank data can be put online	data must be collected
EXPLORE	local job files can be input	data must be collected
GIS	capacity for inputting	data must be collected; TSC will do this for a fee or data can be collected by client
SIGI	no, except to note where there are differences from national data	no, except to note where there are differences from national data
VIP	yes	yes

	National occupations	Education and training
CHOICES	no national occupations file; 1100 primary Canadian occupations; 800 FL occupations (7-digit SOC); 600+ NC occupations (4-digit SOC)	no national college file yet; NC college file will be available
CIS	national information included in occupational descriptions rather than as a separate file	regional/state/local training programs, colleges, vocational/technical schools; working on national college file
COIN	280 national occupations	college majors file; 2- and 4-year colleges; school subjects can be added for local schools
CVIS	430 national occupations	1600 colleges (national)
DISCOVER	422 national occupations	1800 4-year colleges and universities; 1400 community and junior colleges; 11,000 technical and specialized schools; 500 graduate and professional schools
EXPLORE	422 national occupations	1800 4-year colleges (national file); state community/junior college file; state technical school file
GIS	875 primary occupations, references to 3000 related occupations	1700 colleges and universities; 1400 graduate and professional schools; 1500 junior colleges and technical institutions
SIGI	approximately 300 occupations	depends on local installation, planning system includes regional schools
VIP	515 careers	3035 2- and 4-year colleges; 7000 vocational/technical schools

	Financial Aid	Apprenticeship	Military
CHOICES	capacity for inputting	capacity for inputting	capacity for inputting
CIS	yes	yes, treated as a training program	yes, included in occupational description
COIN	yes	yes	yes
CVIS	yes	yes, as informational script	yes
DISCOVER	yes, information script including estimating family contribution and sources of funds, in addition to information specific to each school	yes, informational script and reference to particular occupations (clients must provide local data)	yes, information script and file of 420 occupations for which military provides training and for which there is civilian equivalent
EXPLORE	not at this time	not at this time	not at this time
GIS	yes, state financial aids can be added as well	no, but state apprenticeships can be added	yes, 100 military occupations
SIGI	yes	some occupations are noted as apprenticeable	no
VIP	yes	yes	no

	Self-profile/ search strategy	Online tutorial module	Instruction in decision-making skills	Awareness of how, why, what factors narrow choice	Unlimited access to information in system
CHOICES	yes	no	no	yes	yes
CIS	yes	no	no	yes	yes
COIN	yes	no	no	yes	yes
CVIS	yes	no	no	yes	yes
DISCOVER	yes	yes	yes, through Learning to Make Decisions module	yes	yes
EXPLORE	yes	yes	no	yes	yes
GIS	yes	no	no	yes	yes
SIGI	yes	occasional, optional provision for explanations of content	yes	yes	yes
VIP	yes	no	no	yes	yes

	User statistics	Computer-assisted instruction	User session storage	Practicing career decisions
CHOICES	yes	no	no	no
CIS	yes	no	no	no
COIN	yes	no	no	no
CVIS	yes	no, but the easy author language provides the capability to add scripts	no	no
DISCOVER	yes	yes, for decision making; in addition, possesses capability to create modules	yes	yes, through Practicing Career Decisions module
EXPLORE	yes	no, but not sure of this yet	yes	no
GIS	provided automatically on a # of systems, but requires slight modifications on others	no, but TSC has other CAI software	no	no
SIGI	yes	yes, for teaching decision making and decision rules	yes	yes
VIP	yes	no	no	no

7.3.2 Access Strategies

The following matrix describes the search strategy that each vendor system uses. In addition, some systems have learning modules to help users make better decisions on personal values, preferences, interests, etc. Each system has a direct access capability as well. This information was also validated by vendors.

	7.3.2 ACCESS STRATEGIES
CHOICES	Structured search: EXPLORE, consisting of twelve user-selected and prioritized categories of variables - interests, aptitudes, temperaments, education level, environmental conditions, future outlook, earnings, hours of work/travel, physical demands, physical activities, indoor/outdoor, occupational fields. Direct access also.
CIS	Structured search: QUEST, a 21-item inventory of user preferences including temperaments, aptitudes, education level, physical demands, work setting, any combination of these items can be used. Files can also be accessed directly.
COIN	Structured search: user-created occupational profile, based on interests, working conditions, career clusters, education, physical strengths, physical demands, salary. Files can be accessed directly.
CVIS	Structured search: compares student preferences to Roe's classifications. Also has a college search. Can directly access files.
DISCOVER	Guidance process: learning modules on values, interests and competencies, decision-making, career planning, grouping occupations and job search. Direct access as well.
EXPLORE	Guidance process: organization of world of work; assessing work values, interests, skills; examining job characteristics; relationship to majors and programs of study; exploring personal options and ways to enter selected occupations. Direct access as well.
GIS	Structured search: user-selected variables, including interests, aptitudes, physical demands, work conditions, lifestyle, salary, employment potential. Direct access also.
SIGI	Guidance process: examines values and student-selected specifications on those values; examines and compares occupations meeting those values; predicts success in specific college programs; helps students with decision rules and strategies for choosing an occupation.
VIP	Students use a computerized (CRT or batch method) version of the U.S. Employment Services Interest Check List (ICL). 210 work activities are marked and then evaluated by computer. A three part report is then presented to the user on a CRT or a hard copy. A correlation listing between ICL interest areas and VIP careers is also provided.

7.3.3 Costs of Systems

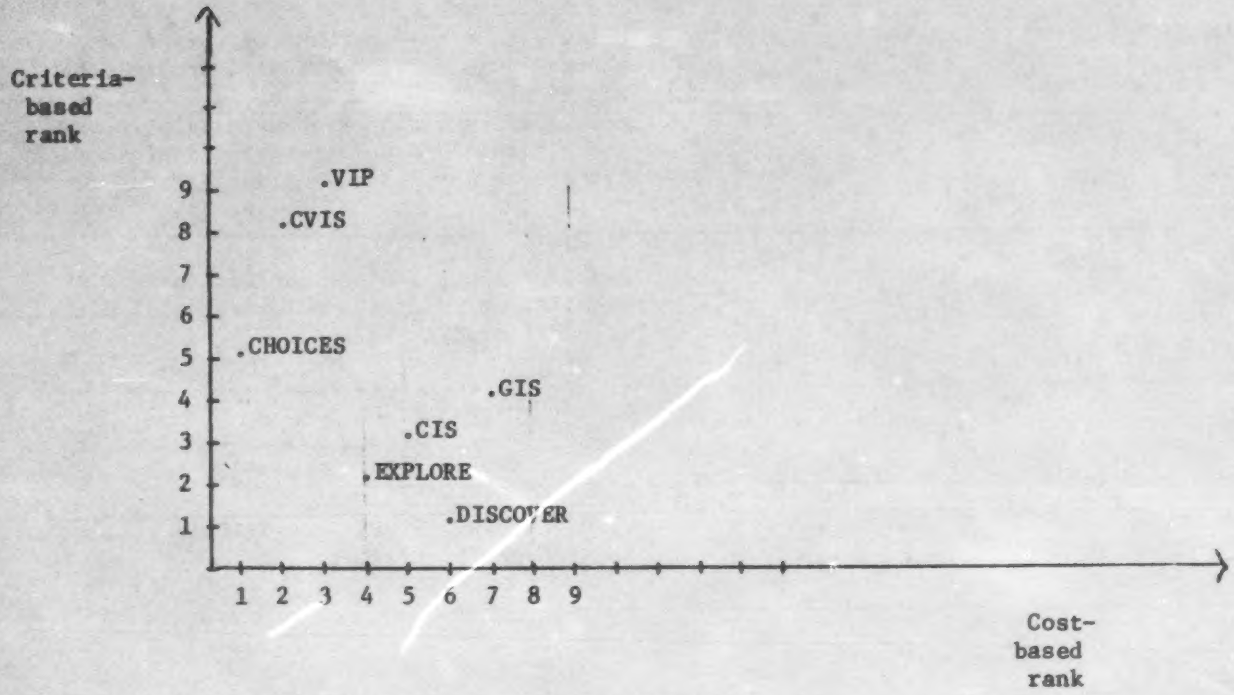
The costs for each system are detailed in Section 3.3. The purpose of the following table (Section 7.3.3.1) is to summarize the costs, using a five-year and eight per cent present value approach. No cost estimates relevant to a statewide system could be obtained from COIN or SIGI; they are priced on a per-terminal basis. The diagram in Section 7.3.3.2 presents the trade-offs between cost and criteria-based ranks.

7.3.3.1 Present value: five-year life, 8% interest.

System	Present Value	Comments
CHOICES	$1,000	Price established by DMR; situation is now changed; CSG and not DMR will probably be handling software source code; School programs developed by North Carolina available for cost of tape and documentation reproduction; Price does not include national data file
CIS	25,404	Price does not include national data file creation or update; Needlesort available at additional cost
CVIS	4,050	
DISCOVER	32,500	Predicated on purchase of Secondary and College/Adult versions
EXPLORE	20,750	
GIS	64,680	Microfiche at additional cost
VIP	5,775	

• See Section 3.3 for details on system cost

7.3.3.2 Trade-offs between cost-based and criteria-based rank.



	(cost-based rank, criteria-based rank)
CHOICES	(1,5)
CIS	(6,3)
CVIS	(2,8)
DISCOVER	(6,1)
EXPLORE	(4,2)
GIS	(7,4)
VIP	(3,9)

- Cost-based rank reported in Section 7.3.3.1
- Criteria-based rank reported in Section 7.2

References

	Matrix: System by Criteria	Access Strategies
Clyde, John S. Computerized career information and guidance systems. ERIC Clearinghouse on Adult, Career and Vocational Education, National Center for Research in Vocational Education. Columbus, OH: the Ohio State University, 1979.		X
North Carolina Occupational Information Coordinating Committee and Office of State Management Systems. North Carolina career information software delivery system study. Raleigh, N.C.: 1978.	X	X
Various vendor publications: CHOICES, CIS, COIN, CVIS, DISCOVER, EXPLORE, GIS, SIGI, VIP	X	X
Conversation/correspondence with vendors listed above	X	X
Vendor validation of information	all, except COIN	all, except COIN

8.0 Implementation Plan

8.1 Introduction

Originally this section was conceptualized as an opportunity to present a fairly comprehensive implementation strategy based on the selection of a single vendor system. The initial intention was that the Career Information Policy Advisory Committee (CIPAC) would choose one system from the Feasibility Staff recommendations for which staff would then generate a management, financial and marketing plan. Since a vendor decision was not made and since two of the three systems recommended are still active candidates for an Illinois statewide system, the following implementation suggestions will instead discuss implementation policies in sufficient generality to include both the recommended systems. As a result, this section will proceed in the following manner. Each of the implementation issues will be treated by 1) detailing what is being done in other states; 2) indicating what is the Illinois situation; and 3) offering recommendation(s).

To reiterate, the vendor recommendations (see Section 7) are DISCOVER and CIS. Basically, the study concludes that as Priority 1, DISCOVER be selected for the statewide system and be delivered on the OMIC computer network located in Springfield. This centralized system which already services a significant percentage of the targeted population would permit an almost immediate CIDS start up. Priority 2 is that a CIDS/CAI combination be affected by adapting or converting DISCOVER to PLATO. As a consequence the extensive PLATO network would serve as a secondary or supplementary delivery network.

Beyond Priority 1, the establishment of a statewide system, the CIDS/CAI endeavor can be undertaken concurrently with the development of Illinois specific occupational and educational information. It is assumed that when fully operational, the two networks will provide a system which offers a desirable blend of national, state and, where feasible, local or regional data.

8.1.1 Comparative State Chart

On the next several pages is a chart which outlines the CIS or CIDS activities in 25 states. Each state is described in terms of system (vendor selected for the statewide system); funding (original source, current source(s) and user fee schedules); management (advisory board composition, staff number and responsibilities); headquarters or housing for system; number of sites in state which are being serviced by the CIDS; relationship with SOICC (agency within or a part of SOICC, subcontract with SOICC or other arrangement); and marketing plans or practices.

Much of this section, 8.2, is a discussion of the policy issues; 8.3 is a model implementation plan for an Illinois CIDS.

8.2 Policy Issues

Before a CIDS can be operational, attention needs to be paid to issues of management and financing. Deliberate planning insures that the system will be managed in a cost efficient manner and that services will be applicable and accessible to the diverse population targeted as potential users.

8.2.1 Administration/Management

8.2.1.1 Location.

The first consideration in regard to managing a CIDS is where the operation should be headquartered. Evident in the following chart is the variety of possible "homes" for a CIDS. Five states have housed the CIDS in state educational units; i.e., Department of Public Instruction or the State Department of Education. Seven additional states have established the CIDS at a university. In one state the CIDS is part of the Employment Service; in another it is in the Department of Labor. Three states have contracted the CIDS operation to a separate non-profit agency or consortium. The remaining eight have established CIDS as part of SOICC.

There are advantages and disadvantages to each choice. When a CIDS is positioned in either education or labor the emphasis tends to be skewed accordingly. A univer-

STATE	MICHIGAN	MINNESOTA	OHIO
SYSTEM	MOIS	MCIS (MECC-delivery)	GIS
FUNDING INITIAL (ORIGIN)	U.S. DOL grant 1974	U.S. DOL grant 1974	U.S. DOL grant 1974
GOV'T SUPPORT AGENCY	Michigan Dept. of Education (vocational-technical service) and CETA funds (fully supported by Dept. of Education and state DOL)	$150,000 (1980) in legislated funds $84,000 CETA funds	CETA grant and SOICC funds
USER FEE SCHEDULE	MOIS provides its services free to user institutions although user sites must pay for associated delivery costs.	MCIS does not exist anymore MECC (delivery) still runs GIS and MCIS program	*Single fee schedule
MANAGEMENT ADVISORY COMMITTEE	MOIS Advisory Board (formal extension of the Michigan Career Education Commission) 1. Michigan DOL 2. Dept. of Education 3. Employment Security Comm. 4. Dept. of Commerce 5. Community colleges 6. Public school systems 7. Private schools and colleges 8. CETA Prime Sponsors 9. Career Education Commission 10. Business 11. Organized labor 12. Users	MOIS BOARD (16 members) 1. Governor's Affirmative Action Program Director 2. Commissioner of Economic Security 3. State employment service 4. Comm. of Economic Security 5. Statewide CETA coordination 6. Comm. of Education 7. Director of State Planning Agency 8. Comm. of Administration 9. Comm. of Personnel 10. Chancellor of Community College System 11. Director of Minn. Higher Education Coordinating Board 12. Dept. of Education 13. Client of CETA 14. Business and industry 15. Organized labor	Ohio Bureau of Employment Services serves as fiscal and personnel agent for OCIS Advisory Board 1. Education 2. Handicapped 3. Employment service 4. Data center network 5. Local community groups 6. Labor 7. User groups

STATES	MICHIGAN	MINNESOTA	OHIO
# OF SITES	501	1500 MECC terminals	230
STAFF	MOIS STAFF (17) 1. Director 2. User service manager 3. User service specialists (2) 4. Information development specialists (2) 5. Secretaries (3) 6. Word processor Part Time: 7. Word processors 8. Graduate student 9. Graphics artist	NO STAFF	OCIS STAFF (15) 1. Director 2. Business manager 3. User service manager 4. Information development manager 5. User services specialists (4) 6. Information development specialists (4½) 7. Clerical staff (3)
HEADQUARTERS OPERATION - SOICC - SUBCONTRACT - OTHER	MOIS is part of Michigan Dept. of Education (Vocational Technical Service) Separate from SOICC	MCIS and staff are NO LONGER IN EXISTENCE. State Dept. of Education is considering taking over updating of state CIDS. Still running GIS.	Part of Ohio Employment Service Agency (separate from SOICC)
MARKETING	Prime target population is secondary students. 1. news releases 2. newspaper articles 3. radio spots MOIS is "easy to market" because the service is free (users pay for cost of delivery school consortiums, etc.)	Prime target population is secondary students. MECC has 10 people who work with schools - particularly guidance counselors. MCIS did have a marketing staff but no longer exists.	User service staff is responsible for the marketing of the system. Methods of marketing found to be particularly effective:* 1. county-wide conferences in user agencies 2. mass mailings 3. exhibits at professional association meetings 4. Articles in local papers 5. radio spots Have aggressive marketing staff. CETA agencies offer money for publicity. *Prime target population was secondary schools - focus is changing to include more libraries and social service agencies.

STATE	CALIFORNIA	NEBRASKA	IOWA
SYSTEM	NO STATE VENDOR*	CIS	CIS*
FUNDING INITIAL (ORIGIN)	$94000 grant from California Post-Secondary Education Commission 1976	Vocational Education Act funds through the State Dept. of Education $98,000 (CIDS grant)	Dept. of Public Instruction 1974 $139,00 CIDS grant
GOV'T SUPPORT AGENCY	In-kind contributions from member schools	University of Nebraska	Dept. of Public Instruction (supported almost exclusively from state administered federal vocational education funds)
USER FEE SCHEDULE	Provide state information to all vendors free of charge (machine readable tapes)	Trade-off for free time Annual budget $200,000	CISI Single yearly fee ($95) for all needs Annual budget $470,000
MANAGEMENT ADVISORY COMMITTEE	Advisory Board (14) Community Colleges (3) CETA (2) Private post-secondary institutions (2) Dept. of Rehabilitation (1) EDD (3) State Dept. of Education (4)		Policy Advisory Board IOICC statutory committee members (4) Business CETA Commission for the Blind Iowa College Aid Commission Iowa Dept. of Job Service Iowa Dept. of Public Instruction Vocational Rehabilitation State Vocational Educ. Advisory Council Iowa Development Commission Iowa Educational Information Cen Library Commission of Iowa Organized Labor Regents Institutions
STAFF	Staff CIDS director and entire SOICC staff	Staff (8½) 1. Director 2. Marketing specialists (2)	Staff (10) 1. Director 2. Marketing specialists (4) 3. Technical consultants (2) 4. Research Associate 5. Inservice Consultant
HEADQUARTERS		University of Nebraska	

STATE	CALIFORNIA	NEBRASKA	IOWA
# OF SITES		20	350
OPERATION - SOICC - SUBCONTRACT - OTHER	Part of SOICC		SOICC functions in advisory capacity to the State Board of Public Instruction which has contract for CISI
MARKETING	California has no state vendor-they collect state career information and provide it free of charge to all vendors in the state. For those agencies not affiliated with a vendor they provide the same information for a small cost in microform. SOICC will continue to update information. Current funding through NOICC-they plan to apply for further NOICC funds. How they will finance data collection and updating when NOICC funds are depleted is unclear.		1. Develop working arrangements with Education Information Centers, Lifelong Learning Project, Iowa College Aid Commission, Iowa Coordinating Council for Post-Secondary Education and Iowa Coordinating Committee for Continuing Education Iowa department of job service and CETA 2. Investigate avenues of support for non-educational user agencies so they can afford system 3. Prepare and disseminate CISI materials, i.e., Leader's Guide
	* EUREKA is widely disseminated throughout state		*Iowa uses the QUEST portion of CIS. CISI was aimed at secondary schools. OIDS will expand CISI to adult population. The current CIDS is state developed.

STATE	ALABAMA	COLORADO	MASSACHUSETTS
SYSTEM	GIS	CIS	CIS
FUNDING INITIAL (ORIGIN)	U.S. DOL grant 1974	U.S. DOL grant 1974	U.S. DOL grant 1974
GOV'T SUPPORT AGENCY	Special Education Trust Fund (State Dept. of Education) SOICC	Self-sustaining system (based on consortium concept)	Self-sustaining system
USER FEE SCHEDULE	Users pay ONLY for terminal (rent or purchase) SOICC pays telecommunications costs (Governor's grant)	Annual consortium fee: $1320/each terminal accessing system Computer time/terminal is $3000 (Total annual cost: $4320) Diversified fee schedule	Cost per month (unlimited use) System: $300 Terminal: 85 Communication: 75 $460 per month (Annual cost: $5520) Diversified fee schedule
MANAGEMENT ADVISORY COMMITTEE	Consortium Representatives: 1. Local boards of education 2. Junior colleges 3. State Tech. colleges and institutions 4. Saate 4-year colleges and universities 5. Chambers of commerce 6. State employment agencies 7. Hospitals and nursing homes 8. Public libraries 9. Labor organizations 10. State rehabilitation agencies 11. Trade and professional associations 12. U.S. Gov't. agencies 13. Other state and regional agencies	Board of Directors appointed by Governor 1. 8 Permanent members who represent human-resource agencies of the state 2. 8-10 Rotating members who represent a range of educational and occupational knowledge and user groups	Board of Directors Includes reps. from the followin 1. Executive Office of Manpower Affairs 2. Dept. of Education 3. Division of Employment Security 4. Organized Labor 5. Business 6. Education 7. User Groups

STATE	ALABAMA	COLORADO	MASSACHUSETTS
# OF SITES	72	178	160
STAFF	STAFF (6) 1. Director 2. Information manager 3. User service manager 4. Information development specialist 5. Programmer 6. Occupation information specialist	COCIS STAFF (13) 1. Executive director 2. Deputy director 3. Software programmer 4. Information development specialists (3) 5. User service specialists (3) 6. Graduate interns (2) 7. Clerical staff (2)	MOIS STAFF (18) 1. Director 2. Manager of information development 3. Information development 4. Manager of user services 5. User services specialists (6) 6. System and evaluation manager 7. Programmer assistant 8. Financial manager 9. Manager of operations for MOIS network
HEADQUARTERS		University of Colorado	
OPERATION - SOICC - SUBCONTRACT - OTHER	Now part of SOICC (no longer AOIS) (occurred when original grant expired)	Separate from SOICC	Separate from SOICC
MARKETING	Primte target population is students (h.s. and college) 2 WATTS lines - have a toll free number and career counselors to answer phones - distrubute number all over state. Those places without terminals are mailed questionnaires (primarily city youth programs), those are batch processed. User Services manager expressed need for much more publicity and better marketing - staff is too small (6).	Merchandising funds, or sales promotion funds very limited - growth possibilities and market awareness have been affected	The user service staff coordinates publicity for their region through generating press releases concerning the use of MOIS.* Marketing high priority of MOIS. - newsletter for Career/ Guidance Info. Systems - news conferences with the Governor - poster contest inviting users to create MOIS posters *Target population - secondary schools.

STATE	WASHINGTON	WISCONSIN	OREGON
SYSTEM	CIS	GIS	CIS
FUNDING INITIAL (ORIGIN)	U.S. DOL grant 1974	U.S. DOL grant 1974	Previous DOL support 1971
GOV'T SUPPORT AGENCY	Legislated "revolving" fund	CETA funds and $135,000 (1980) in legislated funds Now at "break even" state	State Dept. of Education grant U. of Oregon (office space and associated expenses) $25000-35000/year
USER FEE SCHEDULE	65¢ per head with a minimum charge of $300 and maximum charge of $300	*Diversified fee schedule	*Diversified fee schedule
MANAGEMENT ADVISORY COMMITTEE	WOIC Consortium appoints reps. to Board of Directors 1. Office of Governor 2. Office of the Super. of Public Instruction 3. State Board for Comm. College Education 4. Council for Post-secondary Education 5. Employment Security Dept. 6. Comm. for Vocational Edu. 7. Dept. of Social and Health Services 8. Chairperson of WOIS Users' Exec. Committee 9. Exec. Director of SOICC	WCIS Board of Directors 1. Dept. of Industry 2. Labor and Human Relations 3. Dept. of Health and Social Services 4. Dept. of Local Affairs and Development 5. Dept. of Public Instruction 6. Board of Vocational, Technical and Adult Education 7. U. of Wisconsin system 8. WI Higher Education Aids Board 9. Labor and business reps. (with Manpower Council) 10. Employment and Security Div. 11. 6-10 User agency reps.	CIS Consortium - SOICC is a part of it
STAFF	WOIS STAFF (12) 1. Executive director 2. Info. Development manager 3. Info. Development specialists (2½) 4. User services reps. (3) 5. Administrative assistant 6. Systems design 7. Clerical support (2)	WCIS STAFF (13) 1. Director 2. Coordinator 3. User services staff (4) 4. Info. Development staff (3½) 5. Clerical staff (3)	Staff (12-14) 1. Info. analysis (5 and 2 research assistants) 2. Delivery System a) computer loader b) programmer c) clerk part-time 3. User services (3½) 4. General center management (3½)

STATE	WASHINGTON	WISCONSIN	OREGON
# OF SITES	181	150	225
HEADQUARTERS	The Evergreen State College	University of Wisconsin - Madison	University of Oregon
OPERATION - SOICC - SUBCONTRACT - OTHER	Separate from SOICC	Separate from SOICC Part of the Educational Research Dept. at University of Wisconsin	Separate from SOICC Part of CIS Consortium
MARKETING	User services staff responsible for marketing 1. Thrust of marketing directed away from established educational users to social service agencies. 2. Private contractors were tried with limited success largely due to their unfamiliarity with WOIC product and therefore, user needs. 3. Quality of the advertising materials varies considerably hampering merchandising efforts.	WCIDS has staff designated as "salesmen" who visit various sites to sell and demonstrate WCIDS package. Prime target population is secondary schools and colleges. - various posters and displays for promotion and inservice - content-interchangeable three-fold brochure for promotional use - many professional type brochures aimed at user agencies - newsletters to vocational educators	Prime target population is secondary schools and colleges. 4 market areas 1. secondary schools 2. community colleges 3. 4-yr. universities 4. social service agencies Have been least successful with social services agencies: small, independent, high staff turnover. Expensive to market to S.S.A.

STATE	ALASKA	ARIZONA	CONNECTICUT
SYSTEM	CIS	GIS	GIS
FUNDING INITIAL (ORIGIN)	$122,000 CIDS grant	$139,000 CIDS grant	$142,000 CIDS grant
GOV'T SUPPORT AGENCY	Dept. of Education (all funds through this dept.)	Employment Security, Dept. of Ed., Dept. of Labor, Governor's office	Dept. of Education
USER FEE SCHEDULE	$8 x 2/3 number of potential users *Diversified fee schedule	$7200/year per computer Single fee	No fees established yet
MANAGEMENT ADVISORY COMMITTEE	Policy Board SOICC	Advisory Board Dept. of Education Dept. of Economic Security Dept. of Corrections Dept. of Economic Planning and Development State Board of Education Comm. College Board Educational Computer Service Arizona Business Industry Ed. Coun. Arizona House and Senate Organized labor, minorities	Policy Board Exec. director of Dept. of Labor Assist. director of Vocational Rehab. Div. - Dept. of Education Comm. of Labor Dept. Comm. of Higher Education Comm. of Dept. of Education Tech. Steering Committee (3)
STAFF	STAFF (2½) Director (who is also the director of SOICC) User services (1) Some staff from Dept. of Labor and Dept. of Education	STAFF (5) Manager User services coordinator Information analysts (2) Secretary	STAFF (6) Operation manager Research analyst User services specialists (2) Clerk/typist (2)
HEADQUARTERS			
OPERATION - SOICC - SUBCONTRACT - OTHER	Part of SOICC	Separate from SOICC Subcontracted to Office of Econ. Planning and Development (Gov. office) Also report to SOICC	Part of SOICC

STATE	ALASKA	ARIZONA	CONNECTICUT
# OF SITES	50+	75-80	0
MARKETING	- Mass mailings - posters/brochures - newspaper articles - not very effective (Marketing styled after Oregon) - most effective going directly to user agency directors - in-house type of newsletter	Prime target population: - secondary schools and comm. colleges Make individual contacts - make many presentations and demonstrations - newsletter - contact with career/voc. agencies and community college agencies (4 of their 7 base computers are located in community colleges)	Prime target population: high school students (also handicapped and women) No real marketing as of yet.

STATE	DELAWARE	FLORIDA	GEORGIA
SYSTEM	CHOICES	CHOICES	CIS
FUNDING INITIAL (ORIGIN)	$139,000 in CETA funds and CIDS grant from NOICC	$139,000 in CETA funds and CIDS grant from the NOICC	$137,000 CIDS grant
GOV'T SUPPORT AGENCY	Employment Security and SOICC, 2 Governor's CETA grants	Daytona Beach Community College and FLOICC	Georgia State University (small grant) Dept. of Labor
USER FEE SCHEDULE	Free network - software is free. $3000 terminal fee/year subsidized by SOICC for first year only.	$500/month 13 hrs./day	State Dept. of Education helps fund users $2 per user per year 2 fees, 1. info. development and training; 2. delivery fee
MANAGEMENT ADVISORY COMMITTEE	Advisory Board (app. by Governor) Dir. of Voc. Education Dept. of Voc. Rehab. Dept. of Econ. Development Dept. of Central Data Processing Post-secondary Ed. Commission University of Delaware Delaware Tech. and Comm. Colleges Advisory Comm. on Careers and Voc. Education Displaced Homemakers Program Reps. from Governor's office (3) Organized labor Chamber of Commerce Agricultural community Jobs for Delaware Graduates National Alliance for Business Rep. of state legislature Rep. of Urban Coalition	FCIDS Policy Board (7-10) Div. of Voc. Education Div. of Employment Security Office of Manpower Planning Voc. Rehab. Program Office Div. of Econ. Development Career Education Program Client groups Private sector employer Private sector training local users	GCIS Advisory Board SOICC board members User agencies Labor Information Systems Board of Regents for colleges and universities State Dept. of Education State Dept. of Labor State Dept. of Voc. Rehab. State Dept. of Employment Service

STATE	DELAWARE	FLORIDA	GEORGIA
# OF SITES	(October '80 Pilot) 12	35	45
STAFF	Staff (6) Director (SOICC director) Info. development specialists Computer operations (1) (2) User services (1) Administrative specialist (1)	Staff (6 professional, 3 support) Director Assistant director Program manager Systems analyst User services specialist Computer operator Support staff (3)	Staff (12) Director Assistant director User services manager User services specialists (2) Info. development manager Info. development analysts (3) Office manager Clerical (2)
HEADQUARTERS		Daytona Beach Community College	Georgia State University
OPERATION - SOICC - SUBCONTRACT - OTHER	Part of SOICC	The Florida CIDS operates through a contract with the FLOICC fiscal agent - Daytona Beach Community College - on behalf of the FLOICC.	Separate from SOICC Subcontracted to Georgia State University
MARKETING	Prime target populations: secondary schools and disadvantaged youth - newsletters - brochures/posters Because Delaware SOICC/CIDS has identified the agencies they want to be a part of the system, there is no real marketing effort other than persuading members to stay with the system after the first subsidized year. After the first year agencies must pick up the $3000 terminal fee themselves. Delaware CIDS has no plans to become a self-supporting system.	Prime target population is secondary schools. - posters/brochures - demonstrations and group meetings	Prime target population: secondary schools - profile school, identify key people, identify funding sources for school, use contacts, then go in and sell system - many group presentations - some literature

STATE	HAWAII	KANSAS	MAINE
SYSTEM	CIS	CHOICES (Pilot 1/81)	GIS
FUNDING INITIAL (ORIGIN)	$103,000 CIDS grant	$137,000 CIDS grant	$109,000 CIDS grant
GOV'T SUPPORT AGENCY	Dept. of Labor and Industrial Relations. NOICC, SOICC, and CETA grants	Kansas State University EIC funds, SATC funds, State Dept. of Education, $42,000 related to handicapped	Manpower Affairs
USER FEE SCHEDULE	$2500 a terminal per year plus initial fee. Also a graduated fee schedule (cheaper the more terminals you lease)	No fee schedule yet	$500/year and up Subsidized school grant money and terminal purchase
MANAGEMENT ADVISORY COMMITTEE	Advisory Board and Tech. Comm. University of Hawaii Community Colleges Vocational Education Dept. of Social Services Manpower and Full Employment Apprenticeship Program CETA Private user agencies	Advisory Committee (26) SOICC type agencies	Advisory Board State Career Ed. Info. Coordinat State Guidance - Dept. of Ed. Section Chief for Occupational Outlook (State Employ. Security) Bureau of Voc. Rehab. Planner Analyst for the State Employment and Training Council Automation Coordinator for Job Services Planning Coordinator for CETA Prime Sponsor CIDS manager
STAFF	Staff (8) Director Assist. director User services director Assist. user services Secretary Clerk/typist Computer analyst (1½) Data entry/clerk Info. develop. and resources (3) Plus temporary help	Staff (6) 4 full time, 2 part time Project director Technical director Info. development specialist Assist. info. develop. specialist Clerical - info. develop. (2) part-time	Staff (3) Manager Support staff * User training and marketing * contracted with State Office of Career Education * Data development done by SOICC

STATE	HAWAII	KANSAS	MAINE
# OF SITES	45	0 (October '80 Pilot)	80-90
HEADQUARTERS		Kansas State University	With SOICC
OPERATION - SOICC - SUBCONTRACT - OTHER	Separate from SOICC Based in Research and Statistics - Dept. of Labor	Separate from SOICC Subcontracted to Kansas State University	Part of SOICC
MARKETING	Prime target population: high schools and community colleges (also CETA and Voc. Rehab.) - Publicity through SOICC newsletter - Cooperation with Dept. of Education - Workshops and demonstrations (with demo. terminal) have been most successful. Marketing has "succeeded tremendously"	Prime target population, secondary schools, CETA Deal only in software - agencies must provide own hardware. No marketing strategies yet.	Prime target population - secondary schools - group presentations and demonstrations - not many brochures/posters use some of TimeShares handouts - school board demonstrations - aim marketing at school district

STATE	MARYLAND	NEW YORK	NORTH CAROLINA
SYSTEM	TO BE DETERMINED	GIS AND CHOICES (Pilot period)	CHOICES
FUNDING INITIAL (ORIGIN)	$138,000 CIDS grant Not in operation yet	$139,000 CIDS grant	$137,000 CIDS grant
GOV'T SUPPORT AGENCY	CIDS money, funds from Dept. of Education, SOICC, and Library Services Construction Act. also CETA-Governor's 4% grant	NOICC grant and matching funds from SOICC and $150,000 in CETA funds	SOICC
USER FEE SCHEDULE	-	Diversified fee schedule	$200-$300/mo. Subsidized by SOICC $3500-$4000 initial fee
MANAGEMENT ADVISORY COMMITTEE	- SOICC and User agencies	Advisory Board SOICC	Advisory Board CETA Vocational Rehab. Dept. of Public Instruction Employment Security
STAFF	-	Staff (20) No identified director Info. development specialists (4) Computer programmer (1) CIDS reps. (marketing) (2) Clerical staff (4) Additional SOICC staff	Staff (5) Not separate from SOICC Marketing Information development
HEADQUARTERS			
OPERATION - SOICC - SUBCONTRACT - OTHER	Separate from SOICC Subcontracting to a non-profit, private agency	Part of SOICC	Part of SOICC

STATE	MARYLAND	NEW YORK	NORTH CAROLINA
# OF SITES	-	0 (October '80 Pilot)	24
MARKETING	Prime target population: secondary schools. Must provide low-cost, easy access package free to all school districts.	Prime target populations: secondary schools, CETA Prime Sponsors, libraries, social service agencies. No real marketing effort because hardware is in place (e.g. 135 school districts with about 800 sites already using GIS) Trial period using both GIS and CHOICES - may decide on one state system but feel there is no problem in having two state systems because the population of New York is so large and diverse.	No marketing plans yet Prime target population is the clients of the advisory board

STATE	SOUTH CAROLINA	
SYSTEM	COIN	
FUNDING INITIAL (ORIGIN)	$136,000 CIDS grant	
GOV'T SUPPORT AGENCY	SOICC and Employment Security	
USER FEE SCHEDULE	$500/year with hardware $250/year without	
MANAGEMENT ADVISORY COMMITTEE	SOICC Executive Board Director of Employment Security Director of Dept. of Voc. Rehab. Director of Dept. of Voc. Edu. Rep. from Office of the Governor - Manpower Division Director of State Board for Technical and Comprehensive Education Director of Higher Education Rep. State Development Board Technical Steering Committee	
STAFF	Staff (11) Part of SOICC	
HEADQUARTERS		
OPERATION - SOICC - SUBCONTRACT - OTHER	Part of SOICC	

STATE	SOUTH CAROLINA	
# OF SITES	120, expect 55-60 more in Oct. - Nov. '80	
MARKETING	Prime target population: high schools Supply terminals free on recommendation of the Board - slide/sound program taken to agencies and school districts - brochures/posters - TV spots/radio/newspaper - "kick-off" meetings Most agencies come to user services staff by word of mouth. - are constantly aware of other systems trying to gear up in S. Carolina	

sity setting permits a fairly impartial, lower cost operation. Universities generally have access to lower salaried personnel to undertake the often tedious, time consuming data collection and formating tasks. Furthermore, academics are available at the university to provide the technical expertise often needed.

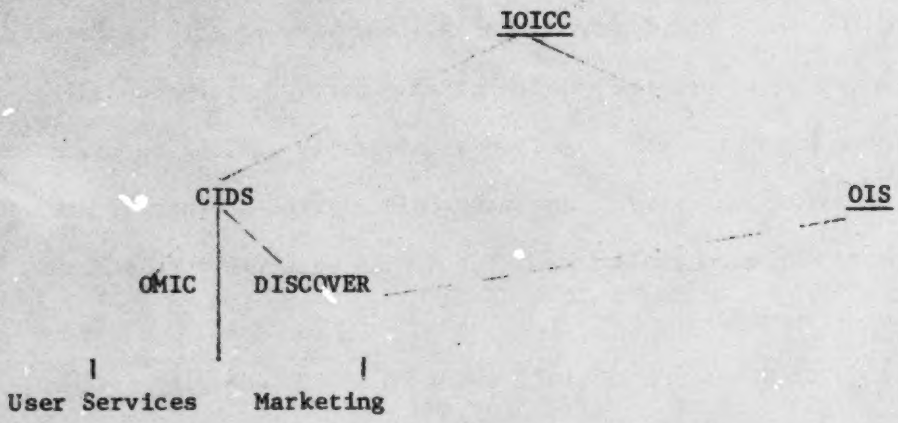
However, it is not always possible to find a university willing to allocate space for such a long term enterprise. Also some universities are not structured to provide the necessary freedom and autonomy for a CIDS which must relate and contract with many constituencies.

Establishment of a CIDS as part of SOICC seems to be the emerging pattern, particularly among the NOICC supported state projects. There are clear advantages to the SOICC-CIDS arrangement. First, SOICC by mandate is expected to serve constituencies in both the education and labor arenas. Second, SOICC appears to be the appropriate clearinghouse for CIDS information development, quality control and maintenance.

Two considerations mitigate in favor of the Illinois CIDS being positioned under IOICC. First is that the CIPAC committee indicated that an Illinois CIDS should target out-of-school youth and adults as the primary market. The SOICC would be the most impartial respondent to the multiple constituencies involved. Second, since the collection and inclusion of Illinois specific data is a top priority in the development of a statewide system, it is appropriate that SOICC guide and monitor the information processing effort.

It is Staff's recommendation that the Illinois CIDS be operated as a unit which reports to the Executive Director of IOICC. Following are two organizational charts which display the relationship of IOICC to CIDS and also to the vendor and computer network.

Priority One

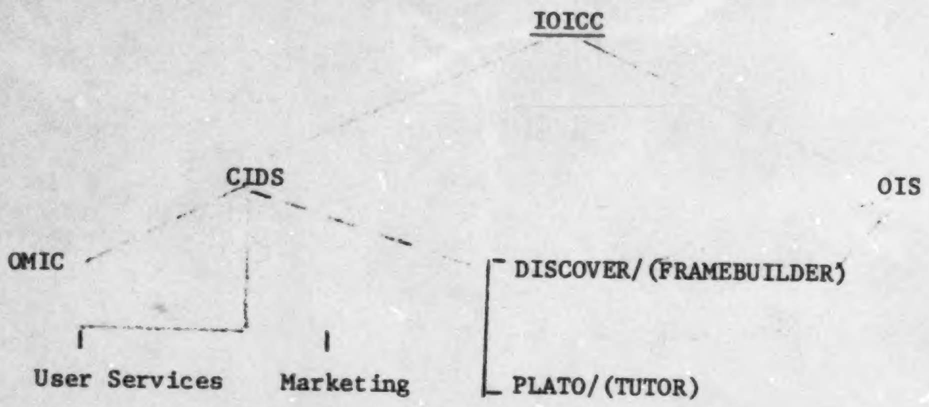


In the schematic above the data collection and formating functions are part of the OIS (Occupational Information System) aspect of IOICC activities. The tie to CIDS in this case is with and through DISCOVER, particularly in respect to the Frame-Builder component of the DISCOVER program which permits data entry. The CIDS-related information processing is but one aspect of the total IOICC occupational information dissemination responsibility.

The CIDS will maintain relationships with both OMIC and either the DISCOVER Foundation or IBM, whichever is the selected vendor. OMIC would assume responsibility for implementing DISCOVER on the network, planning telecommunications, assisting users in the technical aspects of DISCOVER, selection of terminals, etc.

In conjunction with DISCOVER, the CIDS staff would train users in counseling with DISCOVER and would market the system to prospective users.

Priority Two

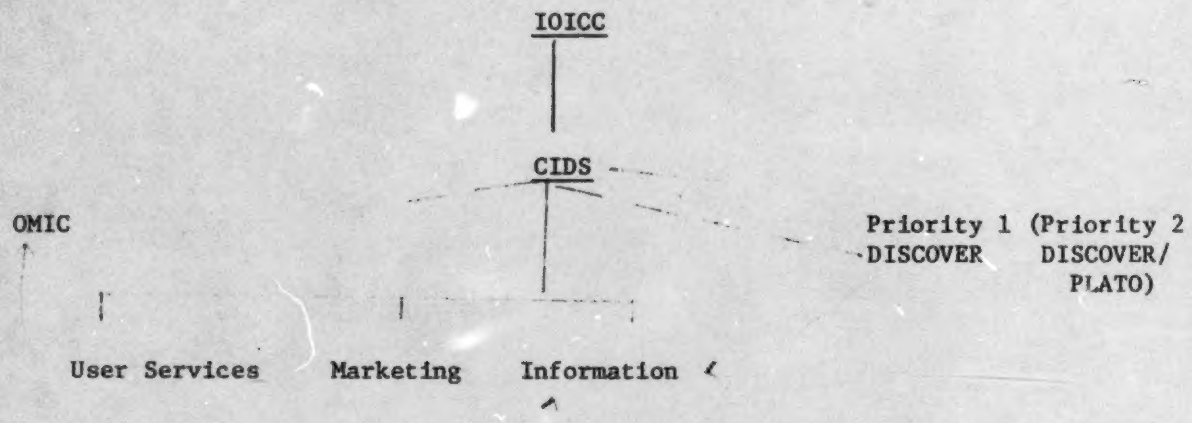


In the preceding schematic the communication flow changes only slightly. The OIS function now relates to both DISCOVER through FrameBuilder and PLATO through the Tutor language, enabling the entry of data to the system(s) directly.

If CIS is the selected system, the diagram for Priority 1 remains the same with the substitution of CIS for DISCOVER. There is greater urgency in respect to data development in this instance, and the activities of CIDS, CIS (vendor) and OIS are dominated by the goal of collecting and formating Illinois specific data so that a statewide system can be instituted.

Priority 2 remains the same when substituting CIS for DISCOVER, OIS would enter data for the integrated CIS/PLATO system as appropriate.

In the event that the division of OIS and CIDS functions under SOICC is not considered feasible, it is recommended that the general organizational structure advocated earlier be retained with the information development function coming under CIDS direction. The Alternative Structure to Priority 1 and 2 would be displayed as follows:



In this configuration, the CIDS director reports to the IOICC director as before, and, it is assumed that information development will come under close scrutiny of the IOICC director. The assumption underlying Feasibility Study staff's recommendation for CIDS location is that information development is the purview of IOICC and the collection, formatting of data and maintenance of accurate, reliable data is most rationally governed by IOICC.

8.2.1.2. Advisory.

Advisory committees vary in size among the 25 states from a low of 7 to a high of 26. The tendency is to have a board of around a dozen persons who represent the current or prospective user groups. The early CIS grantees were expected to constitute advisory boards which included the following representation: secondary and higher education, manpower and social service agencies, labor, or others designated by the board as appropriate.

NOICC guidelines call for a policy making board of directors who are producers and users of career information (see Section 6 for Organizational Criteria). The 25 states surveyed indicated that they met both CIS and NOICC criteria. Advisory

Boards are generally composed of representatives from CETA, Postsecondary Education, Rehabilitative Services, community colleges and the Employment Service. In addition, chambers of commerce, organized labor, social service agencies, higher education and business are often included. Some boards have membership that encompasses hospitals and nursing homes, technical colleges and institutions, libraries, corrections and economic development agencies.

Essentially, the board should be composed of individuals who have knowledge and experience in the collection and analysis of career, educational, labor market information; as well as information producers and user agencies.

During the needs assessment phase of the Feasibility Study, many potential user groups expressed interest in an Illinois CIDS and the desire to commit time and energy to see a statewide system implemented. Section 5 offers an expansive list of persons, agencies or organization on prospective advisory board membership. An Illinois CIDS might draw from the list of those interviewed or from the attendance at the three workshops. In addition, persons or agencies considered Illinois Resources should be included.

It is recommended that an Illinois CIDS comply with the recommendations offered by NOICC and constitute a knowledgeable, representative board. The IOICC Technical Steering Group (TSG) and the CIPAC would be the core of an appropriate policy advisory board. In view of the repeated interest of statewide library personnel in a CIDS, it is recommended that representation of this group receive priority.

Prior to formation of a CIDS board group, policies need to be promulgated in respect to the following:

- the policymaking authority of the board
- nomination, election and tenure of board members
- selection of board officers
- procedures for calling meetings
- committee structure of board
- board of directors composition
- representation of user agencies

It is recommended that the Illinoic CIDS board be constituted separately from the IOICC board although the SOICC members should be invited for membership. According to NOICC guidelines, the board should be governed by cooperative agreement or charter with the SOICC Director as presiding officer. The CIDS board of directors should be composed of the IOICC statuatory member agencies: Illinois Department of Commerce and Community Affairs, Illinois Department of Rehabilitation Services, Illinois Bureau of Employment Security and Illinois State Board of Education. In addition, the following agencies/organizations are suggested for membership: State Advisory Council for Vocational Education, Illinois State Scholarship Commission, Illinois Community College Board, Illinois Board of Higher Education. Finally, there should be representation from labor, private enterprise, libraries, social welfare agencies and user agencies.

8.2.1.3. Staff.

NOICC, ACSCI and CIS guidelines specify that a system should have a director to coordinate and manage operations. In addition the guidelines promote a staff that can develop information, manage the delivery system and assist user agencies in disseminating information to clients. In all but three of the states a CIDS staff included a Director and at least 2 staff members. Minnesota is reorganizing and has no staff, California has a director but otherwise depends on SOICC staff, Maryland is not in operation yet and is being managed by the SOICC and user agencies.

Staff size as reported by 22 states varies from a low of 2½ in Alaska to 20 in New York State. The core responsibilities reflected in CIDS staffing are: management, marketing, information development and user services. As staff grows the tendency is to enlarge the number in each of the categories above and to add software programmers or systems analysts, research specialists and technicians. Secretaries and clerical personnel are also consistently represented. The largest staffs have included financial managers, and word processing personnel.

Many states combine the user services and marketing responsibilities in the same unit. Site visits to several operational CIDS suggests that there are benefits to be gained by separating these two roles. Where the user service role was defined exclusively as that of providing training and technical assistance and the marketing role was conceived of as identification and attraction of new markets, and public relations, the general operation was more effective. Personnel qualifications for each function are sufficiently different to merit separate selection and orientation.

It is recommended that the information collection function be distinct from CIDS operation and that OIS - tasks, because they involve more than CIDS-related activities, be a separate unit reporting to and governed by the IOICC director. The organizational framework utilized in North Carolina might be considered a model.

An Illinois CIDS would be comprised of a Director, user service specialists, marketing specialists and secretarial and clerical support. The user services function is perceived primarily as technical assistance, training and to some extent program management. Marketing specialists would be expected to identify and approach prospective user groups regarding participation in the system.

OMIC, it is anticipated, would provide assistance with telecommunications, terminal specifications and all problems that relate to computer efficiency. Software problems would be referred to the vendor.

CIDS Staff Responsibilities

Management

Work with Advisory board in establishing policies, priorities and timelines; set terms of services OMIC and vendor, set user fees

Articulate board policies with staff and user interests

Communicate goals and objectives of CIDS across state

Mediate various constituent interests

Establish chain of authority or accountability (organizational structure)

Administer budget, manage material resources

Coordinate efforts of information specialists, vendor and OMIC

Act as intermediary between OMIC, vendor and users

Supervise and train staff

Plan and conduct orientation, in-service training and staff development

User Services

Act as intermediary between users and OMIC concerning specifications for terminal acquisition, computer problems and telecommunications arrangements

Act as intermediary between users and vendor regarding software questions

Train users in vendor system usage

Provide on-going staff development to users

Develop and utilize materials that will assist user agencies and organizations

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Management (cont'd)

Establish schedules and monitor compliance

Authorize and guide the fusion of selected vendor system with PLATO

Marketing

Establish plans for system distribution

Define market

Determine costs of various marketing strategies, select appropriate and cost effective techniques

Develop and maintain consistent CIDS image

Determine target dates for activities chosen

Demonstrate system to prospective CIDS participants

Exhibit system at conferences, meetings, etc.

Information

Develop and format data and work with vendor to input data on system

Inform user services staff about nature of data added

Inform marketing staff about system capabilities and saleable features

8.2.2 Finance

A sound financial base is crucial for the successful implementation and operation of a career information delivery system. Financing a CIDS seems to be more difficult than other grant-initiated programs.

First, grant resources for a CIDS, such as NOICC and CETA, are almost exclusively start-up funds. These granting agencies stipulate in the terms of the grant that the systems must find other resources to support themselves if they are to remain in existence after the initial two-year period (Franklin, 1979, p.4).

Second, the operating costs of a CIDS are not trivial and are not significantly less than implementation costs. The costs of information update, production of user services manuals and marketing materials, user training and coordinating a statewide program are quite substantial.

Third, these operating costs continue year after year. Labor market information has a very short lifespan; school information does not remain fixed either. In addition, users must continually be trained: new users must be introduced to the system, while continuing users need ongoing support. Other materials must be updated as well.

Fourth, the costs associated with additional information are quite high, compared with the costs of serving additional users (McKinlay, 1975). Thus, adding occupations, new information topics, local labor market areas and the like requires a substantial investment of resources.

Last, a quality career information system requires an inter-agency/organization approach, so that a single funding source is difficult to find and reluctant to accept responsibility for such a large endeavor. Of the 25 states with a CIDS, only in two states (Iowa and Michigan) has a single state agency agreed to subsidize operating costs fully. Most states have, therefore, taken the approach that their CIDS must rely primarily on fees for service to cover operating costs once the start-up funds are exhausted.

Given these considerations, it is imperative that a strong fiscal plan be developed. Errors in fiscal management, such as underestimating costs or overestimating revenues, may spell disaster for a state CIDS operation. The Minnesota CIDS, for example, no longer has a staff, but the software is still being run on the state computer network. Here, the CIDS relied on the state legislature for half its revenue, but the legislature ended its last session without passing an appropriations bill. Other CIDS revenue from service fees was insufficient to keep it in operation. Alabama and Colorado experienced fiscal problems as well, having insufficient revenue for maintaining their CIDS. The Alabama CIDS underwent a severe organizational change and was brought in as part of the SOICC. The Colorado CIDS did not charge service fees while receiving NOICC grant funds and found itself with many fewer users once service fees were assessed. The Colorado CIDS was able to recover and now relies on service fees for 97 percent of its revenue.

The preceding discussion has attempted to highlight some of the considerations in financing a state CIDS. The following discussion will focus on the potential revenues and expenses of a state CIDS in light of what other states have done and what the circumstances are in Illinois. Recommendations will also be made.

8.2.2.1 Sources of revenue.

The Case of Service Fees

When considering sources of revenue, it is important to distinguish between the implementation phase and the continuing operation of the CIDS. The implementation phase includes the first two years or so, where the primary emphasis is on development of information files and establishment of the CIDS as a credible service. The sources of revenue for this phase are, for the most part, already known. CETA accounts for about $300,000 in available development funds, while a NOICC CIDS grant could add up to $150,000 in matching funds for each of two years. Sources of revenue to insure the continued existence of the CIDS after the implementation phase, on the other hand, are not assured. What is known is that funding must continue and, therefore, some stable, continuing process for generating revenue must be developed. Most states with a CIDS have implemented service fees as a foundation for financing their systems (Franklin, 1979, p.7). Other sources do exist and include budget allocations from state agencies or state legislatures, grant funds from public or private sources and contributions from private business and industry. These other sources have not been viewed as primary sources, but rather as supplementary sources to augment service fee revenues.

Several reasons have already been mentioned as explanations for state agencies' reluctance to fund a CIDS, for example, the large amount of continuing support the CIDS requires. However, there are positive reasons, as well, for not seeking public funding only, but taking the service fee approach.

First, the service fee concept promotes the political neutrality of the CIDS. A primary function of the CIDS is to provide accurate, unbiased information. Without heavy dependence on a single revenue source, CIDS information analysts are free to look at all extant data sources, be they for labor market information or school and training information.

Second, the CIDS is better insulated from funding shifts if most of its revenue comes from its user agencies. A program shift in one agency will not doom the CIDS. However, if many agencies discontinue support, the CIDS is obviously not meeting their needs and should be discontinued.

Third, service fees from user agencies promotes the accountability of the CIDS. Not only do users have input, but they have significant control over the policies and priorities of the system. The CIDS must respond to the changing and emerging needs of its users for information and services or it will not survive (Franklin, 1979, p.8).

Despite these reasons in support of service fees, there are strong arguments against charging for what seems to be a public service.

First, service fees are sometimes seen as double taxation since publicly provided grant funds were used to implement the CIDS. However, as already noted, operating costs are substantial, almost equal to implementation costs. Thus, someone must pay for these costs, which are quite separate from implementation.

Second, service fees are seen as being out-of-place in the public sector. Yet, there are many public sector services for which fees are assessed on the basis of use, such as public mass transit, public utilities and water systems, parks and recreational facilities, highways and tuition for publicly-supported postsecondary educational institutions (Franklin, 1979, p.9).

Third, the effort to sell the concept of service fees and then to collect and keep records of service fees may not be worth the money collected.

Fourth, and most important, schools and agencies which need the service often cannot afford to pay for it. One way of coping with this problem is to set a sliding fee schedule, based on ability to pay. Another way is to help those agencies apply for grant funds or other contributions to pay for CIDS service.

Other Revenue Sources

As mentioned earlier, most states rely on service fees for a large share of their revenue. However, service fees have not been found to be sufficient to offset all operating expenses. The most promising supplementary sources are listed and described briefly here.

- In-kind contributions: By definition, these are not actual dollars. Most often, an agency will offer free or almost-free office space and facilities to the CIDS. Other in-kind contributions include computer services for data entry and software maintenance and school and/or agency staff designated as CIDS Coordinators who extend the user services support capability of the CIDS organization.

- Line item allocations from the state legislature: Even though this type of support seems logical for a service which is statewide, only a few states have been successful in obtaining legislative funding. One of the problems is that legislative allocations are unstable; they are subject to annual review, so that shifts in priorities may terminate CIDS support even though it is a worthwhile service.

- Support from state agencies: Several state CIDS have been able to gain support from state agencies which do not themselves use the service but have an interest in their success and their use by local institutions that the agencies directly or indirectly serve (Franklin, 1979, p.36). Examples include state-level CETA programs and departments of education. This kind of support is usually in one of three forms: as a grant or contract to perform a particular service, as a grant or contract to support development or refinement of a particular product or to perform an enhancement of the system, as a no-strings grant or contract for general system support.

- Support from private foundations: Few states have attempted to tap private foundation support. Those that have attempted have been unsuccessful and indicate that foundations are more interested in innovative development projects than in providing operating funds (Franklin, 1979, p.39). However, user institutions might be more successful in obtaining funds for programs which include CIDS usage.

- Contributions from private business and industry: This source seems to be untested by current state systems. Companies may be approached as potential users, offering the CIDS service as a fringe benefit to their employees, or they can be approached for general contributions for system support.

Revenue Sources Used by Other States

Of the 25 states with a CIDS, all but California report relying on service fees for some portion of their annual revenue. California does not have a single, statewide system, but collects labor market information and makes it available to all vendors within California. Iowa and Michigan report only a minimal annual fee, while Alabama and Delaware ask users to pay for their terminals only. Kansas and Maryland have not yet established a fee schedule, but have plans to do so. Most other states, Alaska, Arizona, Florida, Hawaii, Massachusetts, New York, North Carolina, Ohio, Oregon and Wisconsin, have established a monthly or annual fee schedule. Nebraska did not provide information. Colorado, Maine, North Carolina and South Carolina also have fee schedules; these depend on computer usage, terminal lease arrangements and/or telecommunications charges. Georgia and Washington charge on a per-user basis.

Some of these states rely on supplementary sources as well. Iowa and Michigan rely primarily on state education and/or labor funds. Delaware, Hawaii, Ohio and Wisconsin receive some CETA funds. Colorado and Massachusetts report receiving no other funds. Funds from the state legislature are reported by Washington and Wisconsin, while Alaska, Arizona, Kansas and Oregon report receiving some state department of education funds. Arizona, Delaware and South Carolina report Employment Security funds as well. Maine reports funds from the state manpower affairs department. Alabama, California and Minnesota obtain funds for telecommunications, information development and computer usage, respectively, from their state governments.

3.2.2.2 Sources of expenses.

Estimated Expenses by Cost Categories

One way of organizing the costs that the CIDS and its users will incur is by functional areas. These areas, as suggested by NOICC, include:

- organization and management;
- information development;
- information delivery;
- user services (includes user training, field support, marketing, promotion);
- evaluation.

These functional areas can then be broken down into the following cost categories:

- personnel, including consultants;
- contract services;
- materials and supplies;
- travel;
- communications;
- services.

The following chart presents the estimated costs for these categories for the first three years of CIDS operation. These costs will have to be included in the CIDS budget. Each category of estimates is followed by explanatory notes. Other costs, whose total amounts vary directly with the number of users, such as terminal leasing, telecommunications and computer time, will be discussed later.

Estimated CIDS Expenses

	Year 1	Year 2	Year 3
Personnel (annual increases of 10%)			
CIDS Director	$24000-28000	$30800	$33880
User Services - Technical Coordinator	19000-22000	24200	26620
User Services - Training Coordinator	19000-22000	24200	26620
Marketing Coordinator	19000-22000	24200	26620
Information Development Coordinator	19000-22000	24200	26620
Secretary (at Administrative Assistant I level)	12000-18000	19800	21780
Clerical Support (two part-time)	10000	11000	12100
Evaluation Consultant	10000	5000	5000
Subtotal Personnel (using upper figure in range)	$154,000	$163,400	$179,240
Fringe (12.66% on retirement plus $60 per month for life/health insurance)	23,817	25,007	27,012
Total Personnel	$177,817	$188,407	$206,252

Notes: Personnel

Estimates for staff salary ranges are given for year 1. The figures for years 2 and 3 represent the upper salary of comparable salary ranges. The subtotal was calculated using the upper salary in each range. Fringe was calculated using figures for the IOICC through their fiscal agent.

Each salary must fall within the guidelines of the state salary structure as well as be in line with wages of positions of comparable responsibilities and tasks in affiliated agencies, such as Department of Commerce and Community Affairs; Department of Rehabilitation Services; Bureau of Employment Security; Department of Adult, Vocational and Technical Education and the IOICC.

If the information development function were part of the CIDS, then additional staff would be required.

Furthermore, additional staff may be required by the second year of CIDS operation in the user services and marketing areas.

Depending on the make-up of the CIDS staff, the evaluation function might be handled inhouse, rather than hired from the outside.

	Year 1	Year 2	Year 3
Contract Services			
DISCOVER			
Vendor license, update fees (from IBM)	15000	16500	1500
Conversion to Plato	subject to negotiation	subject to negotiation	-
Training	1500	as required	as required
CIS			
Vendor license, update fees	10500	4500	4500
Conversion to PLATO	subject to negotiation	subject to negotiation	-
Modifications for OMIC	subject to negotiation	-	-
State college file, updates	+	+	+
State occupations file (descriptions and updates)	+	+	+
Technical support and training	16000	7200	as required
Modifications to use Job Bank data online	subject to negotiation	-	-
Other reference materials from CIS	1200	500	500

Notes: Contract Services

There are two sets of expenses presented: one for DISCOVER and one for CIS. Different activities would be required to implement each as the statewide CIDS.

If DISCOVER were chosen, a decision would have to be made whether to acquire the system from the DISCOVER Foundation or IBM. Differences in vendor fees were outlined in the Summary Chart in Section 7.2 and in Section 3.3.

If CIS were chosen, then state files for two-year and four-year colleges and Illinois occupational descriptions would have to be developed (see Section 8.2.3 on Information Development). In addition, some modifications would be necessary for the CIS software to conform to OMIC specifications. The costs for these modifications, as well as the conversion to the PLATO system, would have to be negotiated with the Oregon CIS.

Regardless of which system were chosen, state occupational information would have to be gathered. Different costs would be incurred by the CIDS depending on where the OIS function were placed (see Section 8.2.3 on Information Development and Section 8.2.1.3 on Staff).

Materials and Supplies	Year 1	Year 2	Year 3
DISCOVER			
Terminal, printer, maintenance (based on two-year lease)	5862	5862	5862
Telecommunications	+	+	+
Computer Usage	+	+	+
DISCOVER poster	500	250	250
Counselor's Manual (cost-recovery basis)	6000	3000	3000
Promotional Literature (brochures, pamphlets, posters, etc.)	3000	3000	3000
Miscellaneous Office Supplies	3000	2000	2000
CIS			
Terminal, printer, maintenance (based on two-year lease)	5862	5862	5862
Telecommunications	+	+	+
Computer Usage	+	+	+
User's Guide (on newsprint)	5000	5000	5000
Counselor's Manual (cost-recovery basis)	4000	2000	2000

Notes: Materials and Supplies

Most expenses for materials and supplies would be the same whether DISCOVER or CIS were chosen. However, the marketing and user services approaches might differ and system-dependent information would also differ.

CIS would probably require a User's Guide to be printed for the individual client. DISCOVER would not require a user's guide, but would require a poster mounted near the terminal to present the DISCOVER options to the user.

A counselor's manual would be developed for either CIS or DISCOVER. Promotional literature, such as brochures, pamphlets, posters, would also be developed.

	Year 1	Year 2	Year 3
Travel	10000	10000	10000
Airfare, mileage reimbursement, per diem, including trip to CIS workshop or annual DISCOVER conference			
Communications			
Telephone	700	700	700
Postage	500	500	500
Services			
Office space (assuming 10% annual increases)	10000	11000	12100

Notes:

Travel

The amount of $10000 is given for travel expenses, but this is only an estimate. This amount will differ, depending on the marketing emphasis, number and location of workshops and demonstrations.

Communications

Estimates are given for telephone and postage.

Services

An estimate is given for office space. However, in many states, office space is donated to the CIDS as an in-kind contribution.

Totals: Estimated CIDS Expenses

		Year 1	Year 2	Year 3
Personnel		$177,817	$188,407	$206,252
Contract Services				
	DISCOVER	16,500+	16,500+	1,500+
	CIS	27,700+	12,200+	5,000+
	other	+	+	+
Materials and Supplies				
	DISCOVER	12,362	9,112	9,112
	CIS	14,862	12,862	12,862
	other	6,000	5,000	5,000
Travel		10,000	10,000	10,000
Communications		1,200	1,200	1,200
Services		10,000	11,000	12,100
	DISCOVER	$233,879 +	$241,219 +	$245,264 +
	CIS	$247,579 +	$240,669 +	$252,514 +

Other CIDS Expenses

The expenses outlined thus far would be incurred at the state level. There are, however, additional expenses which are incurred at each user site. These include terminal and/or printer costs, telecommunications and computer usage costs.

Terminal and/or printer costs are determined by a number of interdependent variables. First, the choice of system, DISCOVER or CIS, implies certain terminal specifications. CIS can run on almost any 300-baud asynchronous terminal (CRT or hardcopy). DISCOVER, on the other hand, requires the use of a light pen, implying a more expensive CRT terminal, available from fewer manufacturers.

Second, the use of the OMIC network also affects the choice of terminals. If OMIC retains its policy of all SNA/SDLC-compatible equipment by August 1981, then the type of terminals acceptable for CIS would be significantly upgraded; DISCOVER terminals (from IBM) already conform to these specifications. SNA/SDLC (system network architecture/synchronous data link control) - compatible implies high-speed, efficient and more cost-effective communication between the CPU and a more intelligent terminal. Dial-up communication would no longer be supported. At this time it appears that the new OMIC policy would extend to the CIDS application. And, it is clear that the CIDS staff would have to cooperate with OMIC in acquiring appropriate hardware equipment.

Third, the choice of hardware manufacturer affects terminal cost. SNA/SDLC - compatible terminals are available from at least two vendors, IBM and Courier. If non-SNA/SDLC-compatible equipment can be used, then additional vendors can be contacted -- Hazeltine, Digital Equipment Corporation, Hewlett-Packard and Teletype, among others.

Fourth, before the specifications for the conversion of DISCOVER or CIS to the PLATO system are finalized, it is important to decide on which type of PLATO terminals would be required. For example, if the conversion took advantage of the unique PLATO capabilities, such as touch panels or graphics, the required terminals would be the PLATO IV plasma-screen terminal. Not using the full range of PLATO capabilities would permit a less expensive terminal. Here, too, firm agreements have to be negotiated between PLATO/CERL and the chosen vendor system staff.

The following table lists the costs of SNA/SDLC-compatible equipment from IBM.

Approximate Costs for IBM Terminals

Terminal Type	Description	Monthly Lease	Purchase Price	Minimum Monthly Maintenance
IBM 3276	standalone CRT; has communications feature and modem interface; could be used by CIS.	$202.00	$7915.00	$47.00
IBM 3276	standalone CRT; has communications feature and modem interface; light pen; could be used by DISCOVER.	$215.00	$8500.00	$47.50
IBM 3278	additional CRT if IBM 3276 already at site; can add up to seven of these to each 3276; for CIS.	$70.00	$2835.00	$16.00
IBM 3278	additional CRT if IBM 3276 already at site; can add up to seven of these to each 3276; for DISCOVER.	$83.00	$3420.00	$16.50
IBM 3287	printer at 80 cps; can be attached to 3276 for printing any display on CRT screen; can be used in setting with 3276/several 3278s; for CIS or DISCOVER; other speeds available (40 cps or 120 cps).	$176.00	$6311.00	$50.00
IBM 3767	printing terminal; modem at additional charge; looks like selectric typewriter; could be used by CIS.	$190.00 (40 cps) $235.00 (80 cps) $286.00 (120 cps)	$6850.00 $6750.00 $7450.00	+ + +

Note: additional 10% educational allowance applies to accredited schools and colleges.

Telecommunications charges are dependent on the number of users, the extent of their use and their location, but not on the distance between them and the CPU. Cost-effective line arrangements will be handled by the OMIC telecommunications staff. The OMIC staff cannot give further information on telecommunications costs without specific information on the above-mentioned variables. Again, commitments should be secured with the OMIC staff.

Computer usage costs cannot be easily estimated. As of September, 1980 the OMIC billing structure was being revised. The variables which affect computer charges include central processing time, number of transactions and storage. Given further specifics on the CIDS application, the OMIC staff could give approximate computer usage charges once their new billing structure is determined.

8.2.2.3 Mathematical models for assigning service fees.

The purpose of this section is to develop various types of rate structures for the service fee. A basic model and two additional models will be presented. The additional models include one where all user agencies/institutions are treated equally and one where two categories of agencies/institutions are considered, state and non-state.

Basic Model

$$T = \text{Variable Costs} + \text{Fixed Costs}$$

$$= (T_{tl} + T_c + T_t) + C_o$$

where T = total expenses incurred by the Illinois CIDS

T_{tl} = total terminal leasing costs

T_c = total computer usage costs

T_t = total telecommunications costs

C_o = total central CIDS office expenses

Model 1: No Difference among User Agencies/Institutions

$$T = (T_{tl} + T_c + T_t) + C_o$$

version 1: assign average costs based on total number of user agencies/institutions

n = total number of user agencies/institutions

$$\text{cost per agency/institution} = \frac{T}{n} = \frac{T_{tl} + T_c + T_t + C_o}{n}$$

- each agency/institution will pay the same service fee, regardless of size or number of terminals in use
- large agencies/institutions with many CIDS terminals may have an unfair advantage at the expense of smaller users with only a few CIDS terminals

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version 2: assign average costs based on the total number of terminals in use

t = total number of terminals used for CIDS

$$\text{cost per terminal} = \frac{T}{n} = \frac{T_{tl} + T_c + T_t + C_o}{t}$$

- each agency/institution's service fee will be based on the number of terminals at that agency/institution

- may discourage use of multiple terminals by smaller agencies/institutions

version 3: assign average costs among user agencies/institutions employing number of terminals and number of user agencies/institutions

t = total number of terminals

n = total number of user agencies/institutions

u_i denotes each user agency/institution, $i=1,\ldots,n$

t_{u_i} denotes number of terminals at user agency/institution u_i

$$T = (T_{tl} + T_c + T_t) + C_o$$

$$\text{service fee for user } u_i = \frac{T_{tl} + T_c}{t_{u_i}} + \frac{T_t}{n} + \frac{C_o}{n}$$

- terminal leasing costs and computer usage costs are assigned to each agency/institution based on the number of terminals being operated at each

- telecommunications charges are shared equally among user agencies; may not be completely fair since some agencies/institutions may have terminals scattered over a large area, while other user agencies/institutions may have terminals in only one location

- central CIDS office expenses are shared equally among user agencies/institutions

Model 2: Separate State Users from Non-State Users

$$T = (T_{tl} + T_c + T_t) + C_o$$

after separating state agencies/institutions from non-state agencies/institutions, equation above becomes:

$$T = (T_{tl_s} + T_{c_s} + T_{t_s}) + (T_{tl_{ns}} + T_{c_{ns}} + T_{t_{ns}}) + C_o$$

where s denotes costs incurred by state users and ns denotes costs incurred by non-state users

Versions 1 and 2 as in Model 1 could be presented, but these will still be inadequate because they do not distribute costs fairly.

version 1: assign costs using number of user agencies/institutions in each category and number of terminals in each agency/institution

$$T = (T_{tl_s} + T_{c_s} + T_{t_s}) + (T_{tl_{ns}} + T_{c_{ns}} + T_{t_{ns}}) + C_o$$

$$\text{service fee for user } u_i = \left(\frac{T_{tl_s} + T_{c_s}}{t_{u_i}} + \frac{T_{t_s}}{n} \right) + \left(\frac{T_{tl_{ns}} + T_{c_{ns}}}{t_{u_i}} + \frac{T_{t_{ns}}}{n} \right) + \frac{C_o}{n}$$

- advantage here is that non-state users which tend to be smaller organizations are assessed slightly lower fees; state agencies/institutions are assessed slightly higher fees

- central CIDS office fees would still be shared equally

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version 2: let state users pay directly for their own use, while charging average fees from non-state users (as in Model 2, version 1 above)

$$T = T_{tl_s} + T_{c_s} + T_{t_s} + T_{tl_{ns}} + T_{c_{ns}} + T_{t_{ns}} + C_o$$

$$\text{service fee for state user } u_i = \frac{C_o}{n} \quad \text{(just a system use fee)}$$

$$\text{service fee for non-state user } u_i = \frac{T_{tl_{ns}}}{t_{u_i}} + \frac{T_{c_{ns}}}{t_{u_i}} + \frac{T_{t_{ns}}}{n} + \frac{C_o}{n}$$

- advantage here is that state agencies/institutions pay directly for computer usage and telecommunications and pay the equipment vendor directly for terminal leasing

- CIDS staff has to handle non-state users primarily, which tend to be smaller organizations

- costs for non-state users would still be assessed on the basis of number of terminals operated

Further Considerations

It is not clear whether to assess the telecommunications cost portion of the service fee on the basis of the number of terminals used by the agency/institution or just the number of user agencies/institutions. Input should be sought from the telecommunications network staff at OMIC.

Also, it seems appropriate to develop a sliding scale for the service fee based on the number of terminals in order to encourage use of multiple terminals. Under this scheme, having two CIDS terminals would not double the service fee for a single terminal.

8.2.2.4 Recommendations.

Revenue

It is recommended that the Illinois CIDS be self-sustaining by the third year of operation, through the collection of service fees from its user agencies/institutions and organizations. Agencies such as Public Aid, Rehabilitation Services and Employment Security; institutions such as schools, colleges and universities; organizations such as community-based organizations (CBOs). It is also recommended that these fees be charged per terminal on a sliding scale so that a second terminal does not double the cost to the agency/institution. Rather, agencies/institutions should be encouraged to increase the number of terminals available to their clients.

The following variables affect the service fee:

- terminal and/or printer--user agencies/institutions should be responsible for acquiring their own terminals. The CIDS staff, in cooperation with OMIC, should make a list of appropriate equipment and financing (leasing, purchasing) arrangements available.

- computer usage--user agencies, especially schools and non-profit organizations, should not be billed for computer time separately. The philosophy should be to encourage use of the CIDS. If schools were to be charged based on use, this would discourage CIDS use. Rather, the CIDS staff, in conjunction with OMIC, should determine an average cost based on a regular Monday to Friday 40-hour week, with allowances for evening and Saturday use as well. This charge, then, should be built into the total service fee. State agencies, on the other hand, already use the OMIC network. Billing of these agencies should continue as currently being done.

- telecommunications--because of the fluid nature of the telecommunications network, it is appropriate for these costs to be averaged for non-state agency users and be built into the service fee. State agencies, again, should continue to be billed in the same manner as currently being done.

- system fee--this portion of the service fee should cover the CIDS management expenses, including personnel, contract services materials and supplies, travel, communications, services as well as system enhancements, such as development of specialized files and program modules for particular target groups. This fee would be charged all CIDS user agencies/institutions, independent of the number of terminals used.

The billing structure has to remain simple. There will be two sets of fees--one for state agencies and one for non-state agencies and institutions. State agencies will pay only a CIDS system fee and will pay their own terminal, computer usage and telecommunications costs. Other institutions will pay their own terminal costs and will be billed for other CIDS services at a monthly rate, as outlined above.

The following chart presents the proposed billing structure.

STATE AGENCIES/INSTITUTIONS	NON-STATE AGENCIES/INSTITUTIONS
billed by Illinois CIDS • system fee, per agency/institution	billed by Illinois CIDS • system fee, per agency/institution • computer usage, averaged per terminal • telecommunications, averaged per terminal
paid by agency/institution • terminal costs • computer usage • telecommunications	paid by agency/institution • terminal costs

It is not recommended that any CIDS services be offered free of charge during the grant period. Furthermore, any subsidy of the CIDS service fee should be in exchange for some tangible service from the user agency/institution and come in the form of a mini-grant, based on an application from the agency/institution. Service fee charges should begin in the first year of operation.

It is recommended that the CIDS staff apply for grant funds for financing specific program improvements, not for financing normal program operations.

Expenses

It is recommended that the CIDS staff seek out in-kind contributions from state agencies to reduce actual cash outlay, especially for office space (statuatory agencies). Another appropriate area for in-kind contributions is information development, labor market data (IDOL, DCCA, BES) as well as educational and training data (IOE, IBHE, ICCB, ISSC).

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8.2.3 Information Development

CIS, NOICC and ACSCI standards for information development are enumerated in Section 6. The criteria for information development most stressed by these standard bearers are:

1) occupations should reflect the occupational structure of the area served
2) the purpose of the occupation and the responsibilities held by employees should be described
3) working conditions should be described
4) tools and special equipment required in the work should be specified
5) data regarding earnings should be included
6) employment outlook, particularly projected supply, demand, should be provided
7) licensing, certification requirements should be spelled out
8) methods of entry should be described
9) formats should be understandable to diverse populations
10) maximal use should be made of current data

Interviews and workshops conducted as part of the Feasibility Study (see Section 5) yielded strong opinions regarding CIDS information content. The most reiterated plea was for localized educational and occupational information. In concurrence with NOICC, ACSCI and CIS, Illinois professionals and practioners highlighted the importance of job characteristic information which includes skill requirements, educational level, licensing requirements, salary and benefits, entry and advancement information.

The Criteria Tree in Section 6 is a composite statement regarding the informational aspects of an Illinois CIDS. The weightings in Section 7 suggest how content elements should be valued in implementing a system.

Illinois resources for information development are listed in at least two publications available in the state. The Illinois Labor Market Information Directory 1978-79, produced by the Bureau of Employment Security - Research and Analysis, is a guide to sources of labor market information in the state. The Directory is divided into four major sections: 1) publications and reports; 2) local labor market analysts and their geographical location; 3) services and contact sources within the Illinois Department of Labor; and 4) a guide to related information sources in the Chicago area. An early publication, Illinois Data Resources for Manpower Planners prepared by the Management and Technical Services Unit, Governor's Office of Manpower and Human Development (now Department of Commerce and Community Affairs), is a handbook offering the "latest and best data sources available." The publication is organized for the local manpower planner but some sections are applicable to a CIDS information developer: population figures; labor market information and, economic indicators.

Of particular importance to Illinois information developers, is the recent publication which is the result of a study sponsored by IOICC, The Illinois Occupational Information Needs Study, which provides the framework for informational needs, sources and formats conducive to the purposes of a majority of potential CIDS user groups. (See Section 2.8 for discussion of the Information Component)

Recommendations regarding Illinois CIDS Information Development can be summarized as follows:

- the OIS function should be established and maintained as a distinct and separate unit from CIDS reporting to IOICC
- if separation is not considered feasible, the OIS function should come under the auspices of CIDS, but data collection efforts should be monitored by IOICC to prevent duplication of efforts with other state agencies or organizations. (Note: It is imperative that there be a uniformity of approach to industry and schools, etc. from which data is collected, and that many information developers do not attempt to obtain data from the same sources. IOICC can foster and facilitate collaboration in these efforts.)
- guidelines promulgated by NOICC and ACSCI should be consulted and observed
- Illinois CIDS Feasibility Study information priorities should be adhered to
- data is to be inputed into the system using the SOC codes.

8.2.4 User Services

The user services component of CIDS operation provides the human element upon which smooth and effective implementation depends. The user services personnel serve as the critical core of the CIDS organization statewide. They are the people who represent the system to users. Their perceptions of the system are the ones conveyed. Their knowledge or lack of it concerning system capabilities determines whether a statewide career information system develops and prospers or not.

Both ACSCI and NOICC standards specify that a staff member be responsible for supervising the delivery network and be available for consultation with user agencies. Implicit in the guidelines is that a liaison person is required who can serve as the link between and among users, the vendor, technical or computer specialists and system management.

User services staff become the conduit for dissemination of information regarding the system to all participating agencies and organizations and conversely refer user comments and suggestions to the appropriate sources for action or system revision. The facilitative role of user services, therefore, is primary in achieving an efficient and respected system.

All of the states visited as part of the Illinois Feasibility Study delineated the user service function and designated staff to perform the requisite tasks. In addition to the tasks outlined earlier under User Services, some CIDS include materials development, production of a user newsletter and system evaluation as part of the User Services job description.

As indicated, some CIDS include the marketing function as part of User Services responsibilities. Ohio, Massachusetts, Michigan and Washington are among those states which integrate user services and marketing endeavors. Clearly some of the efforts in each category overlap. Both service and marketing people need to fully understand the dimensions of the system, its capabilities and limitations. However defined and structured both user services and marketing roles involve demonstration of the system.

Personnel in either or a combined category represent the system to users and/or prospective user agencies or organizations.

The major advantages to combining the two sets of responsibilities, beyond the obvious economic saving on reduced staff size, are that the CIDS staff would be less fragmented, less departmentalized and that one knowledgeable source presents information to the public. A single voice and image is projected.

The basic disadvantage rests in the different nature of the tasks to be performed. The user services tasks are directed to participating user groups. The essential activities are service and support. Service and support in this context mean training of user personnel in the system, provision for on-going user staff development, and assistance in ensuring smooth operation for clients. As pointed out this is basically a facilitative function.

Marketing tasks, on the other hand, are directed to prospective or potential user groups. The anticipated outcome of the marketing effort is that new users will be sold on the system and become part of the statewide CIDS delivery network. There are fundamental differences in the personality, experience and competencies of user services and marketing staff.

Implementation of a CIDS in Illinois which eventually will be self-sustaining necessitates a well-orchestrated marketing effort buttressed by a management unit which provides for the continuous support services needed by participating users. An effective user services staff is likely to be one of the most attractive features in marketing a CIDS.

Illinois is a large state with an extremely diverse population. The interviews and workshops conducted as part of the Feasibility Study (see Section 5) indicate the variety of potential user groups. In order to reach out and adequately serve students, CETA participants, military personnel, incarcerated men and women and all the others who are prospective users of computer-based career systems, CIDS staff must be sensitive to the particular characteristics and needs of each user group. This sensitivity is expressed chiefly in the activities of the user service personnel as they tailor their efforts to each participating agency or organization. While being fully cognizant of the information needs which distinguish one group from another; for example, an Hispanic group such as the Latin American Task Force from a Displaced Homemakers center, the user services personnel must maintain a system useful to all.

If language is the overriding concern of the Hispanic group and sex bias that of the displaced homemaker, it is the responsibility of the user services staff to enable the respective client organizations to discover and use in the system that which corresponds to their needs.

It is recommended that the user services staff assume responsibility for maintaining and supporting the CIDS, and that the following tasks be considered the general framework for the user service function:

- train participating agency and organization personnel in the use of the system
- provide ongoing staff development to users
- serve as intermediary between users and vendor regarding system questions
- act as intermediary between users and computer technicians regarding terminal acquisition, telecommunications and other hardware considerations
- develop and utilize materials that will assist user agencies and organizations.

8.2.5 Marketing

The survey of 25 states revealed considerable interest in marketing, but in most cases intentions and plans outpaced activities. Primarily, the lack of initiatives in the marketing area was due to the emphasis paid to other CIDS operational areas that demanded more immediate attention. Information development was often cited as the priority effort. The agenda for the National Governor's Association Technical Assistance workshops (Kansas City - late August; Maine - early September; Atlanta - mid September) attests to the importance placed by CIDS and SOICC directors on improving their marketing approaches. Two-thirds of the scheduled time of the workshops was allotted to marketing considerations.

The need to market a CIDS system, once established, was frequently cited by those interviewed and by workshop participants during the Illinois Feasibility Study. Respondents expressed concern that information regarding the system would reach out to all the potential user agencies.

It is recommended that an Illinois CIDS be attentive to marketing from its start up and that a marketing plan be instituted and implemented as quickly as possible. If DISCOVER is selected the vendor system, then the urgency for marketing is increased due to the ability of the system to be operational almost immediately. If CIS is selected, the planning stage for marketing can coincide with information development. Implementation of the marketing plan and the system would then occur simultaneously. A process for developing a marketing plan follows.

8.2.5.1 Developing a marketing plan.

Before a marketing plan can be developed the principal tasks need to be clarified and the attendant issues or questions resolved. The following is an outline of those tasks and the respective considerations. (The terms in parenthesis are the marketing expressions for the tasks to be undertaken.)

Tasks	Considerations
1. Determination of desired user mix in terms of CIDS stage of development. (System Distribution)	a. In what order should user groups be approached to achieve desired mix? b. What is the optimal number of users in terms of ability of CIDS staff, OMIC and vendor to service users? c. What is total amount of user fees required to maintain a statewide system? (Cost Recovery)
2. Identification of system features and capabilities vis-a-vis each targeted user group with sensitivity to population differentiation by location; i.e. ES Chicago and ES Carbondale. (Product Definition)	a. How will CIDS deliver system? What costs will be fixed? What services will be provided? How will OMIC and vendor share in responsibility to service users? (Benefits) b. How will various user groups pay for CIDS participation? To what extent will different fiscal and budgeting practices and cycles influence decisions in regard to CIDS participation? c. Can alternative participation rates (grants, special terms) and alternative participation modes (consortia) be extended? (Incentives)
3. Identification of markets, i.e., user groups (schools, CETA, ES, CBOs). Determination of distinguishing characteristics of each. (Market Definition)	a. What is the match between system features and user group characteristics? How can system meet needs of each market? How do user needs differ in respect to location; i.e. Southern or rural Illinois vs. urban areas? (Market Segmentation) b. What differentiated approach to each market segment (including location factors) is indicated? c. Who are decision-makers in each category of users?
4. Identification of possible marketing techniques. (Marketing Strategies)	a. How can techniques be matched to populations as defined and differentiated above? b. What are the relative merits of publicity (advertising in mass media, direct mail-letters and brochures), public relations (news stories, professional association and/or organizational newsletters, conference presentation and displays) and direct sales? c. How much will each technique cost? d. Can a selection or mix of techniques be made based on anticipated impact and cost?

Tasks	Considerations
5. Determination of an Illinois CIDS identity, a consistent style of presentation. (Image)	a. What logo or identifying symbol would be most expressive of or appropriate for CIDS image? b. What tone should be adopted in all printed materials? c. What features of the system and what services should be singled out and widely touted?

Once the tasks listed above have been accomplished, then the following steps can be initiated:

1. Develop marketing program based on assessments of Tasks 1-5.
2. Determine time frame, targeting dates for starting and completing certain efforts; establish benchmarks for assessing effectiveness.
3. Establish budget.
4. Assign staff responsibilities and/or initiate contracts.
5. Develop marketing intelligence system*, i.e., maintain a profile of each prospective CIDS participant with data regarding organization's structure, key personnel and particularly, decision-makers.
6. Monitor program; keep records which indicate who participated as a result of what marketing strategy.
7. Reassess effectiveness according to benchmarks (Step 2).
8. Modify appropriately.
9. Evaluate.

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*This term and some of the others used in this section have been drawn from Philip Kotler's book, Marketing for nonprofit organizations, New Jersey: Prentice-Hall, Inc., 1975.

8.3 Implementation Strategy

The implementation strategy for the Illinois CIDS can only be generally described until the specific vendors are chosen. The strategy is shown in the following flow chart.

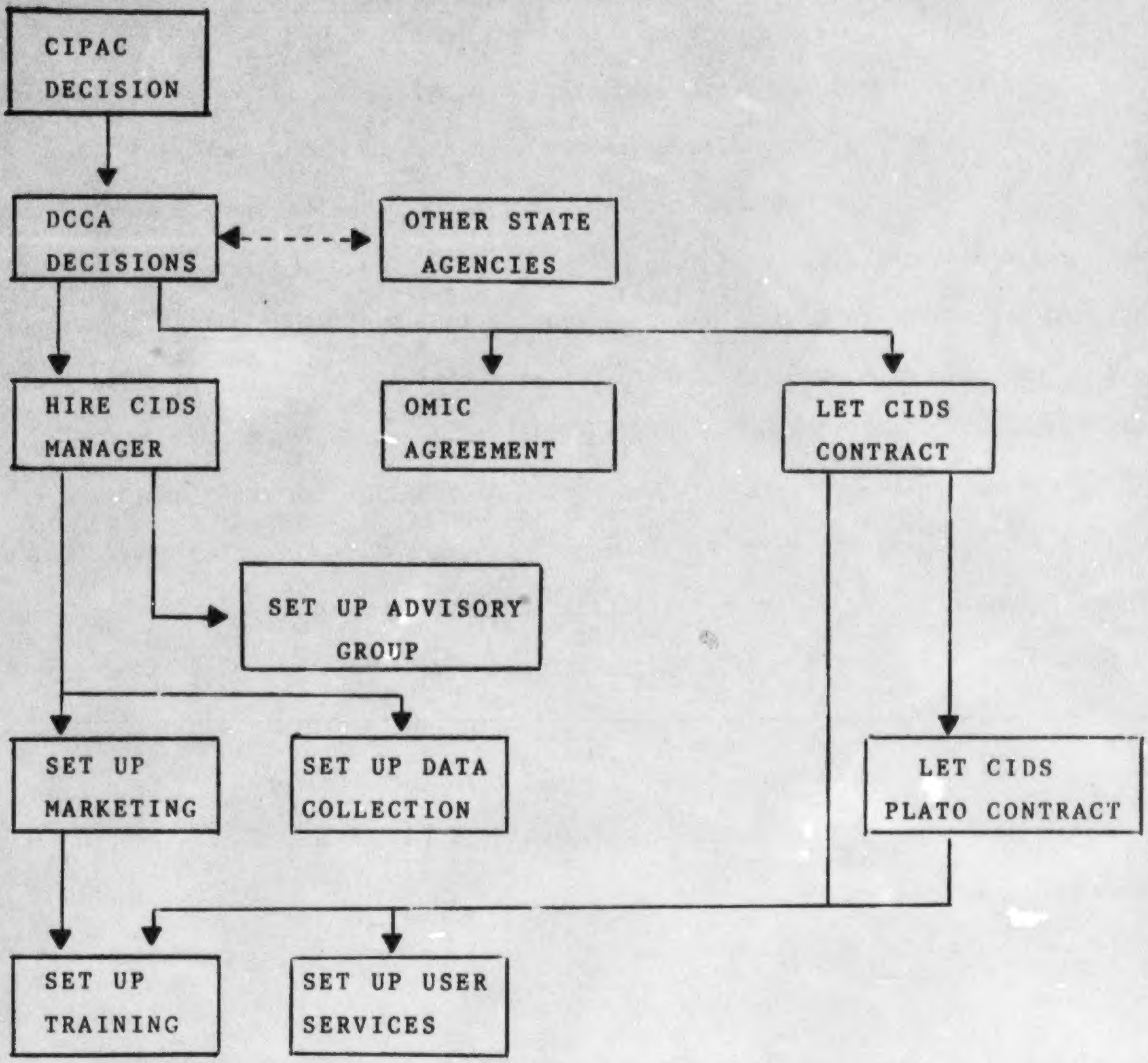
The first step is the vendor decision by CIPAC. This advisory decision must be reviewed by DCCA and formal commitments must then be made. In the process of making these decisions close coordination with other state agencies, expecially the statuatory agencies, is imperative. Decisions on the distribution of activities and responsibilities are critical. The level and amount of centralization of CIDS and its relation to all IOICC functions must be clear. Two parallel activities must be now carried out. Contractual activities and program staffing must be done.

Program staffing starts with the hiring of the CIDS manager. Depending on the organizational plan hiring of additional personnel for marketing and data collection must be done. Later, additional staffing in training and user services may have to be hired. Clearly, the organizational pattern, numbers and types of persons depend on the aforementioned CIPAC and DCCA decisions. As staffing and organization occurs, marketing must be started. At the same time the development of local state files will be started. Training and user services needs will depend upon the vendors chosen and the contractual arrangements made.

The vendor and OMIC contractual arrangements must be initiated as soon as the DCCA decisions are made. It is desirable but not required that a CIDS manager be hired before initiating these actions. Once the initial vendor and OMIC relationship is planned, negotiations with CERL/UIUC regarding PLATO must be started.

The CIDS manager once hired, should become responsible for the coordination and scheduling of the implementation. The advisory group would receive reports from the CIDS manager on progress and develop policies as requested.

Implementation Flowchart


CIPAC DECISION
DCCA DECISIONS
OTHER STATE AGENCIES
HIRE CIDS MANAGER
OMIC AGREEMENT
LET CIDS CONTRACT
SET UP ADVISORY GROUP
SET UP MARKETING
SET UP DATA COLLECTION
LET CIDS PLATO CONTRACT
SET UP TRAINING
SET UP USER SERVICES

References

Franklin, Paul. Financing a career information system. Eugene, Oregon: Oregon Career Information System, 1979.

Kotler, Philip. Marketing for non-profit organizations. New Jersey: Prentice-Hall, Inc., 1975.

McKinlay, Bruce. Organization of a career information system: The Oregon approach. In Labor market information for youths, Seymour L. Wolfbein. Philadelphia: Temple University, 1975, 253-262.

APPENDICES

APPENDIX A

Interview List

American Library Association

Aurora College

Bureau of Apprenticeship and Training (U.S. Department of Labor)

Bureau of the Blind, Marion

Bureau of Employment Service - WIN Program

Career Guidance Center, Chicago

Champaign Consortium, Prime Sponsor

Chicago Board of Education

College of DuPage, Career Planning

Community and Economic Development Association of Cook County, Inc. - CEDA

DeKalb School District #428

Displaced Homemaker (Project Newstart)

DuPage County CETA, Wheaton, Prime Sponsor

Eastern Illinois University, Career Planning, Charleston

Education Network for Older Adults

Educational Service Region - McDonough and Hancock Counties: Regional Superintendent of Schools

Glenview Naval Air Station: Education Services Officer

Highland Community College, CETA Agencies, Freeport

High Schools:
    John Hersey H.S.: Career Counselor
    East Leyden H.S.: Vocational Guidance Associate
    Maine South H.S.: Career Resource Center

Illinois Board of Higher Education

Illinois Children's Hospital School: Regional Guidance Counselor

Illinois Community College Board

Illinois Department of Public Aid, General Assistance

Illinois Department of Vocational Rehabilitation: Bureau of Rehabilitation Services for Children

Illinois Farm Bureau, Springfield

Illinois Indian Employment and Training Center

Illinois Job Service, Southeast Region, Marion

Illinois Management Training Institute

Joliet Correctional Center

Kane/DeKalb Consortium, Geneva, Prime Sponsor

Kishwaukee College, Malta

Lake County Vocational Center

Latin American Task Force

Lewis University, Counseling Center, Romeoville

Macon County, Prime Sponsor

Madison County Consortium, Edwardsville, Prime Sponsor

McLean County CETA Program, Bloomington

Midwest Women's Center

Minority Information Referral Center

Monmouth College

Northern Illinois University, Career Placement, DeKalb

Old Orchard Hospital: Social Work Department

Peoria Consortium, Prime Sponsor

PUSH: Career Exploration Project

Region #14 Career Guidance Center, Tamins

Rockford Consortium, Prime Sponsor

Rock Island County Manpower Planning

Sangamon Cass Consortium, Prime Sponsor

Senior County Service Employment Program

Shawnee Consortium - CETA Agencies, Karnak, Prime Sponsor

Southeastern Career Guidance and Education Center, Flora

Southern Illinois University, Career Planning, Carbondale

Springfield and Sangamon County Community Action, Inc.

Springfield League American Indian Brotherhood

Veterans Administration, North Chicago: Career Vocational Program

Veterans Administration, North Chicago: Drug Program

Vocational Assessment Center, Joliet

Wabash Area Development Center, Mills Shoals

Wheaton College, Career Development

Will County Consortium, Joliet, Prime Sponsor

Women's Bureau (U.S. Department of Labor)

YMCA: Office of Training and Human Development

APPENDIX B

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Page 1

CIDS PROJECT: INTERVIEW SCHEDULE

I. Description of the agency--AGENCY ONLY

Name:

Address:

Phone:

Director:

Interviewee:

Position:

Briefly describe your agency, relative to career information

Overall goal/objective

Kinds of services offered (relative to career information)

Percentage of agency's activities (if multi-service agency)

What do you see as the agency's role:

(a) Mandated

(b) Chosen

Funding level:

Source of Funding:

Number of staff persons working for your agency:

Paid staff:

Volunteers:

II. Clientele served

A. Clientele served--AGENCY

Describe the clientele served by your agency:

race:

age:

sex:

socio-economic status:

income level:

previous work experience:

skill level:

educational level:

English-speaking ability:

physical/emotional limitations:

institutionalized:

past/present:

when/how long:

number of persons served:

where do they live:

(outreach) How are people recruited for your CIDS services?

referral from____________
percentage referred___________

How are people contacted?
Where is your intake point?

Do they have to go to a center?

How do they get to where the services are?

Is there more than one center?

Where are centers located?

Why is clientele being served?

- -- aid in changing jobs
- -- aid in upgrading jobs
- -- job placement
- -- educational information
- -- aid in job search
- -- acquire new skills, training
- -- apprenticeship
- -- other counseling

When is clientele served?

--days? evenings? weekends?

How often is clientele served (typical duration)?

How long is session?

Number of visits per client per year?

Means of contact?

Number of counselor contacts by phone?

B. Clientele served--CLIENT

name:

age:

sex:

socio-economic status:

income level:

previous work experience:

skills:

education:

English-speaking ability:

physical/emotional limitations:

institutionalized:

past/present
when/how long

Where do you live:

How do you come to the agency:

Why do you come here:

-- aid in changing jobs
-- aid in upgrading jobs
-- job placement
-- educational information
-- aid in job search
-- acquire new skills, training
-- apprenticeship
-- other counseling

When do you come here:

---days? evenings? weekends?

How often do you come here:

how long is session
number of visits per year per client
means of contact
number of counselor contacts by phone

III. Resources currently used

A. Resources--AGENCY

What kinds of career/vocational information services do you provide for your clients:

- -- job title
- -- job description
- -- qualifications
    - -- education
    - -- skills
    - -- other
    - -- previous work experience
- -- other requirements
- -- location of jobs
- -- work conditions
- -- salary
- -- education/training opportunities
- -- Equal Employment Opportunity/Affirmative Action quidelines
- -- financial aid availability for job training

*(at end) (will they volunteer this) {
- -- apprenticeship
- -- nontraditional job opportunities for women

Do you currently have access to a computer:

Is it used in client counseling:

how is it used? who uses it (direct client or intermediary counselor)?

What type of computer is it:

own or lease?

use a remote terminal?

What are the costs involved:

Personnel

number {
computer operators ____
programmer ____
terminal operator ____

Is the career information purchased/supplied by a vendor:

which vendor:

how much does it cost:

what mode is it delivered in (pamphlets, cards, on-line terminals, interactive, microfiche, computer print-outs,...):

Do you collect this information for yourself:

Do you collect this information for a library or file?

Do you do studies to gather original data?

How much does this cost($)

What other resources do you use:

What mode is it delivered in:

Do you have a budget for career information:

If so, how much?

How much person-time is involved?

B. Current resources--CLIENT

Does the agency provide you with career information:

What kind of information is provided:

-- job title
-- job description
-- qualifications
 --- education
 --- skills
 --- other
 --- previous work experience
-- other requirements
-- location of jobs
-- work conditions
-- salary
-- education/training opportunities
-- Equal Employment Opportunity/Affirmative Action guidelines
-- apprenticeship
-- nontraditional job opportunities for women

*(at end) will they volunteer this)

How much time would you spend to find it?

How far would you go for it?

Do you pay for this information?

If yes, how much?

If no, would you be willing to pay for it?

How much?

IV. Future--AGENCY and CLIENT

What career services should be offered in Illinois?

What services would you like offered?

Would you like -

- -- job information(licensing, etc.)
- -- education/training information
- -- help with career decision-making
- -- quality of work life of occupation
- -- prospects of job in future
- -- salary and benefits
- -- seasonality
- -- mobility
- -- apprenticeship
- -- nontraditional opportunities for women

What characteristics would you look for:

- -- cost
- -- convenience
- -- availability (time)
- -- accessibility (place)
- -- personal assistance (counseling)

Have you ever used

(1) personal interview and career counseling
(2) printed materials
(3) microfiche/microfilm
(4) computer

If yes, are you comfortable using it?

How much money would you be willing to spend for such a CIDS?

APPENDIX C – WORKSHOP PARTICIPANTS

ATTENDANCE SHEET

CIDS Workshop
Evanston, Illinois
June 17, 1980

NAME	AFFILIATION
Jim Haas	College of Lake Co. 19351 W. Washington St. Grayslake Il. 60030
Alice Scott	Evanston Township High School 1600 Dodge Ave. Evanston, Il 60204
Cheri Erdmann	St. Xavier College, Chicago Il 60655
William L. Hayes	Goodwill Industries of Chicago and Cook County
Patricia A. Towell	Institute of Psychological Services Illinois Institute of Technology
Valerie Pilotte	Freeport Catholic Schools 1419 S. Galena, Freeport, Il
Mary Carson	Central YMCA Community College Chicago, Il
Judy Eroz Riepl	Marengo Community High School 816 E. Grant Hwy. Marengo, Il 60152
Charmaine Hamore	CEDA 624 S. Michigan, Chicago
Donna Fantozzi	Comm. + Economic Developement Association of Cook County, Inc. 624 S. Michigan, Chicago 60605
Joan Roberts	Illinois Job Service Evanston Office 1572 Maple St, Evanston
Valerie Z. Callagher	Northeastern Il Univ.- Chicago 60625
Willis G. Shay	Joliet Township High School District
Mary Arsinow	U.S. Office of Personnel Management 219 S. Dearborn Chicago, Il 60604

Louisa Childs	Olsten Temporary Services 430 W. Touhy Park Ridge , Il 60068
Hank Walderon	East Leyden H.S. and Illinois Vocational Guidance Association Franklin Park, Il 60131
Maurita Scharman	H.S. Secondary Counselor Pearl City H.S. Pearl City,Il 61062
Anne Rodgers	Harper College Roselle and Algonquin Palatine, IL
Anthony Przekeason	Educational Service, Region of Cook Co. 33 W. Grand Chicago, Il 60610
Charles R. O'brien	Western Illinois University Macomb, Il 61455
Ida Fitzgerald	Minority Referral Center 770 Lee St. Des Plaines, Il
John Orcutt	Area Vacational Center La Salle, Il 6 Creve Couer
Rosemari Todd	Dept. of Personnel, City of Chicago Chicago,Il 60602
Ruth J. Young	Chicago Housing Authority 5853 Indiana Chicago, Il 60602
Carol Petok	Southwest Women Working Together Chicago, Il 60629
Dr. H.B. Campbell	U.S. Army Recruiting Command Ft. Sheridan,Il 60037
Peg Hansen	Department of Mental Health Harry Horner Children's Hospital
Susan McKnight	Lake Co. CETA Program Waukegan Il 60085 307 W. Washington
Ann Fettinger	Lake Co. CETA 150 S. Genesee St, Waukegan, Il 60085

Mary Hughes	Placement Office Governor's State University Park Forest South, Il
John Cripe	Joliet Junior College
Bill Arndt	Cook County Office of Manpower Services
MiMi Mosgers	Works Education Council of South Suburbs
Don Kreger	Work-Education Council of South Suburbs
Pat Deroshier	Computerized Guidance- CBOE
T. Gradolf	Chicago Board of Education
W. Overocker	Ft. Sheridan Army Education Center
Ronda Barton-Hicks	Chicago Urban League
Bob Allred	Zion-Benton Township High School Zion, Il 60099
Clarianne Woalard	14 W. Jefferson Joliet Il Will County Schools
James Heald	UICC
Charles Wolfe	Highland College, Freeport Il
Jim Parker	Region 1 Career Guidance Center Highland College, Freeport, Il
Kathy Sexton	5658 S. Moody Chicago, Il IIT Rehab. Counseling
John W. Vayo	10006 Main Richmond-Burton High School
Chris Schneider	Richmond-Burton High School 10006 Main
Donnita Barton Dulania	2206 Westchester Springfield IOICC
Brian Maxwell	100 N. LaSalle, Rm. 1812, Dept. Rehab. S Chicago, Il 60602
Debra Pearlman	220 S. State St. Chicago, Il 60604 Chicago Council of Fine Arts
Roger L. Pulliam	U. of I., Chicago Urban Sciences

Don Hanratty	State Board of Education Springfield, Il
James Drake	Chicago Board of Education 10538 S. Langley Corliss Fenger High School
Peter Johnson	State Council for Vocational Education Springfield, Il
Chris Dimas	Chicago City-Wide College Chicago, Il
Bill Candley	The Alternative Schools Network 1105 W. Lawrence Chicago, Il 60637
La Velle Wilson	Thornton Community College So. Holland, Il 60473
Gail McCommon	7603 No. Sheridan Road Chicago, Il 60626

ATTENDANCE SHEET

CIDS Workshop
Springfield, Illinois
June 24, 1980

NAME	AFFILIATION
Harold Coker	DORS 2785 N. Monroe Decatur, IL
Rob Sepesy	DORS 2785 Monroe Decatur, IL
Joseph R. Pukach	Lewis and Clark Community Col Institutional Development Godfrey, IL 62035
Rick Jouett	Carter Guidance Center-15 Lewis and Clark Community Col Godfrey, IL 62035
Marilyn A. Kushak	Springfield Adult Education Placement 201 E. Laurel St. Springfield, IL 62704
Barbara Kane	Tri-County Industry-Education Labor Council Lincoln Hall Illinois Central College East Peoria, IL
Donna Brown	Job Service 215 W. Lawrence, P.O. Box 438 Springfield, IL 62708
Carol Rhea	SACVE
Larry Jones	WIN 628 E. Adams Springfield, IL
Mary Ann Merano	ISBE
Nancy Harris	ISBE
Tom heffern	ISBE Res. and Analysis 923 So. Sixth Springfield, IL 62703
Sue Ramm	LLCC Shepherd R. Springfield, IL 62708

Jim Coup	LLCC
Bruce Summers	Chester Mental Health Center Chester, IL
Greg Heavner	Office of Manpower Development Edwardsville, IL 62025
James Manton	OMD Edwardsville
Vincent Schmidt	Lewis and Clark Library System Edwardsville, IL
Berma Patrich	Educational Opportunity Center Belleville, IL
Larry Stagen	Washington Community High School 115 Bondwort Washington, IL 61571
Carolyn R. Hawkins	Ill. Community College Board 3085 Stevenson Drive Springfield, IL 62703
George Bertolino	Reg. 17, Career Guidance Center Macomb, IL 61455
Pamela Hammond-McDavid	Sangamon State University Career Services-F50 Sheppard Rd Springfield, IL 62708
Sally Callahan	IYACC 100 N. First St. Springfield, IL 62701
Marilyn Okon	Dept. of Public Aid 528 S. 5th Springfield, IL 52672
Louis Serman	University of Illinois at Chicago Circle Campus Chicago, IL 60680
Batt Maher	Placement Director Western Illinois University Macomb, IL 61455
Robert Wright	DORS Carbondale, IL 62901
Alvin Roberts	DORS Carbondale, IL 62901
Ann Monroe	McFarland Mental Health Center Springfield, IL

Otha L. Davis

Springfield Urban League
2500 South Grand Ave. East
Springfield, IL 62708

Paul Musgrove,
Executive Director

Tri-County Industry-Education-
Labor Council
Lincoln Hall, Illinois Central
College
East Peoria, Il 61635

ATTENDANCE SHEET

CIDS Workshop
Marion, Illinois
July 1, 1980

NAME	AFFILIATION
Jim Henry	Career Guidance Center #13 P.O. Box 38, Flora, IL 62839
Harvey S. Idens, Director	CPPC Southern Illinois University-Carbondale
Hank Hayes, Counselor	BTHS-West Belleville, IL
Dennis Hoffman	Labor Market Economist, IL Dept of Labor Mt. Vernon, IL
Bob Worden	Labor Market Economist East St. Louis
Mike Vessell	Labor Market Economist, Illinois Department of Labor Harrisburg
Owen Humphrey	Regional Office of Education Madison County
Robert R. Smith	Illinois Department of Rehabilitation Services Belleville, IL (235-4263)
David H. Koch	Labor Market Economist Murphysboro
E.A. Hruza	SIUC STC Allied Health
Bill Cortella	Illinois Hospital Assn. - Reg. 5
Diane Solberg	Illinois Hospital Association
Carl F. Galligos	IDORS P.O. Box 2348
Clarence Haege	Freeburg School District 70-Freeburg, IL
Lawrence Meggs	Freeburg School District 70-Freeburg, IL
Mary Stiehl	Southwest Planning Commission Collinsville, IL
John M. Selvister	Reg. 15 C.G.C./Bellville Area College
Mary Hartzog	Illinois State Job Service S.E. Region

APPENDIX D

Agenda-CIDS Workshop

June 17, 1980
Evanston, Illinois

10 A.M. - 10:20 A.M. — What is a CIDS?
Gustave J. Rath, Principal Investigator
CIDS Feasibility Study

10:20 A.M.-10:55 A.M. -- CIDS Feasibility Study Progress Report

10:55 A.M. - 11:30 A.M. -- Nominal Group Technique Description

11:30 A.M. - 12:45 P.M. — Lunch

12:45 P.M. - 1:00 P.M. -- Organization into Small Groups

1:00 P.M. - 3:30 P.M. -- Nominal Group Technique Small Groups

3:30 P.M. - 4:00 P.M. -- Plenary Session and Questionnaire Completion

APPENDIX E

Agenda, CIDS Workshop

June 24, 1980
Springfield, Illinois

10:00 A.M. - 10:20 A.M. -- What is a CIDS?
Gustave J. Rath, Principal Investigator
CIDS Feasibility Study

10:20 A.M. - 10:55 A.M. -- CIDS Feasibility Study Progress Report
Marilyn Jacobson, Project Director
CIDS Feasibility Study

10:55 A.M. - 11:30 A.M. -- Nominal Group Technique Description
Barbara T. Grabowski, Project Investigator
CIDS Feasibility Study

11:30 A.M. - 12:45 P.M. -- Lunch

12:45 P.M. - 1:00 P.M. -- Organization into Small Groups

1:00 P.M. - 3.30 P.M. -- Nominal Group Technique Small Groups

3:30 P.M. - 4:00 P.M. -- Plenary Session and Questionnaire Completion

APPENDIX F

Agenda-CIDS Workshop

July 1, 1980
Marion, Illinois

10:00 A.M. - 10:20 A.M. -- What is a CIDS?
Gustave J. Rath, Project Investigator
CIDS Feasibility Study

10:20 A.M. - 10:55 A.M. -- CIDS Feasibility Study Progress Report
Marilyn Jacobson, Project Director
CIDS Feasibility Study

10:55 A.M. - 11:30 A.M. -- Nominal Group Technique Description
Barbara Grabowski, Project Investigator
CIDS Feasibility Study

11:30 A.M. - 12:45 P.M. -- Lunch

12:45 P.M. - 1:00 P.M. -- Organization into Small Groups

1:00 P.M. - 3:30 P.M. -- Nominal Group Technique Small Groups

3:30 P.M. - 4:00 P.M. -- Plenary Session and Questionnaire Completion

APPENDIX G

SYSTEMS QUESTIONS

VENDOR QUESTIONS

SYSTEM QUESTIONS

Information Development

1. How many occupational titles are included in the system? What percentage of employment in the system's service area do they represent?
2. What do your occupational files consist of? What are the topics covered? In what format is the information presented?
3. Is the occupational information at the local, state, or national level, or any combination of these?
4. What do your educational files consist of? What are the topics covered? In what format is the information presented?
5. Is the educational information at the local, state, or national level, or any combination of these?
6. Do you have any additional files?
7. What is the process for updating and reviewing the information in the files? How often are files updated or reviewed?
8. What sources of information are used for compiling or updating occupational information?
9. What is the reading and vocabulary level utilized in the system? How does this level vary with the occupational description?

Delivery Systems

1. What are the delivery system media?
2. What method is used for referring users from one medium to another?
3. Are micrographics (microfilm and microfiche) utilized in the system or can they be incorporated into the system?
4. Are manual systems utilized or can they be incorporated into the system?
5. Can the users operate the system independently? What educational/intellectual background is necessary for independent use?
6. Does the system provide a summary copy of the information delivered to the user for reference? Can users obtain additional materials?
7. Are booklets and reading materials on how to use the system provided to the users? What background is necessary for comprehending these materials?
8. What is the range of ability levels and background of current users?
9. Does the system make users aware of its limitations?
10. What is the duration of a single session? How many sessions per user are recommended? What is the total time required?
11. Is a direct access mode available?
12. Is a structured access mode available?
13. Is a guidance model used? Are complementary counseling services provided?

14. What help is provided by the system to users having difficulties?

15. What information is required (or allowed) from the user? Is this information stored? For how long?

16. Are any tests conducted? On-line or off-line?

17. How are the user's records, or test results used in the accessing strategy? What are the empirical and educational data? What is the basis for this relationship?

18. Are personal records used to limit system use?

19. Can a user access any information in the system?

20. What safeguards exist to protect confidentiality of records?

21. What is the speed of information retrieval and average response time for each medium? How much time is needed for providing the user with the user summary information?

22. Does the system provide counselors with a user summary profile?

23. How many potential users can the system reach? How many persons annually use the system? How many sites (terminals) are in existence?

24. How long has the system been in existence? How has it been modified or updated since it was established?

25. Are there any research activities for updating and upgrading the system?

26. What is the process for updating information and creating new files? What are the time delays of this process?

27. How often is the computer software checked for reliability or updated?

28. What equipment (hardware) does the system consist of? What kind of, if any, computer network is utilized?
29. How much of this hardware is part of existing state resources? What was leased? What was purchased?
30. What are the hardware servicing and installation arrangements and procedures?
31. Is there a backup system to be used during "down-time" or updating?
32. What are the memory and storage requirements for the files?

User Services

1. Are there training programs for instructing the staff in the use and operation of the system? For information gathering and user services?
2. Are there training services for user agencies?
3. Is a user summary profile available for counselors?
4. How many persons compose the staff, and what are their tasks?

Finance

1. What are the costs of the system per site? Per user?
2. What is the pricing schedule developed for user agencies?
3. What was the initial investment in the system? What were the past capital investment costs?
4. What are the annual operating costs? The proportions for

staff, information gathering and updating, user services, and delivery systems?

5. What percentages of costs can be supplied by user agency revenues?
6. How are the various costs expected to vary in the future?

Evaluation

1. What are the evaluation activities or studies being conducted, or that have been conducted, if any?

VENDOR QUESTIONS

A. Delivery System

1. What are the delivery system media?
2. What method is used for referring users from one medium to another?
3. Are micrographics (microfilm and microfiche) utilized in the system or can they be incorporated into the system?
4. Are manual systems utilized or can they be incorporated into the system?
5. Can the users operate the system independently?
   - What educational/intellectual background is necessary for independent use?
6. What vocabulary level is expected from users?
7. Does the delivery system provide a summary copy of the information delivered to the user for reference?
   - Can users obtain additional materials?
8. Does the vendor provide users with booklets and reading materials on how to use the system?
   - What background is necessary for comprehending these materials?
9. Does the system make users aware of its limitations?

10. What is the duration of a single session?

    - How many sessions per user are recommended?

    - What is the total time required?

11. Is a direct access mode available?

12. Is a structured access mode available?

13. Is a guidance model used?

14. What information is required (or allowed) from the user?

    - Is this information stored?

    - For how long?

15. Are any tests conducted?

    - On-line or off-line?

16. How are the user's records or test results used in the accessing strategy?

    - What is the basis for this relationship?

17. Are personal records used to limit system use?

18. Can a user access any information in the system?

19. What safeguards exist to protect confidentiality of records?

20. What is the speed of information retrieval and average response time for each media?

    - Time for providing the user with the user summary information?

21. Does the system provide counselors with a user summary profile?

22. What is the vendor's policy on checking the computer software for reliability?

23. Does the vendor have any policies, procedures and development plans for updating and upgrading the system?

24. How long has the system been in existence?

    - Has the system been modified or updated since it was established?

25. What help is provided by the system to users having difficulties?

B. Software

26. Does the software package specify files, file organization and format?

    - What is the process for updating information or creating new files?

    - What are the time delays of this process?

27. Can the system operate with additional software from different systems?

28. What are the memory and storage requirements for the files?

29. What computer language(s) does the system use?

30. What kind of computer network and/or system is recommended by the vendor?

C. Hardware

31. Can the vendor supply any hardware?

32. If the vendor supplies any hardware, what is the reliability and mean-time-between-failure for the hardware?

33. List recommended hardware and constraints:

34. Does the vendor system staff install the software package?

35. If the vendor supplies hardware, does he provide servicing?

    - What are the servicing arrangements?

D. User Services

36. Does the vendor have a training program for instructing the

user system staff in the use and operation of the system?

- Does he have training for information analysts or user services staff?

E. Organization

37. How long has the vendor been in existence?

F. Finance

38. What are purchase or leasing costs of the system software package?

39. What are the estimated costs of software reliability studies and updates?

40. What are the estimated purchase or leasing costs for vendor-supplied hardware for a system serving two large SMSA's?

41. What are the estimated hardware costs in serving additional SMSA's?

42. What information can the vendor supply on the per site and per user costs for a system serving two large SMSA's?

    - Total operating costs?

43. What are the hardware servicing costs?

44. How does the vendor expect the software and hardware costs and servicing and updating costs to vary in the future?

Name______________________
Affiliation_________________
____
Date______________________

CIDS Questionnaire

POPULATION

Describe the population(s) that your organization serves:
age:____________________________________
sex:____________________________________
educational level:______________________
reading level:__________________________
English-speaking ability:_______________
previous working experience:____________
other:__________________________________
____

Approximately how many individuals does your organization serve:
each day?__________
each week?__________
each year?__________

In your organization, where are students or clients met:
classroom?__________
office?__________
center?__________
library?__________
other_______________________________________
____

In your organization how are students or clients met: (Check all that apply)
individually?_____
groups (1-10 individuals)?_____
groups (10-20)?_____
groups (20+)?_____

In your organization are students or clients served:
days?_________
evenings?_____
weekends?_____

SERVICES

Indicate with a ✓ which of the following services that you provide.
Indicate with a ✓✓ the service(s) most often provided. (Check all that apply)

_____career guidance
_____job placement information
_____job placement assistance
_____general educational information
_____school, college, university guidance
_____skills training opportunities information
_____other___________________________________
____

Which of the following do you utilize in serving your students or clients:

____personal interviewing and career counseling
____printed materials
____microfiche/microfilm
____computer

With which of the following career information delivery systems are you familiar:

____CIS
____GIS
____DISCOVER
____CVIS
____ECES
____SIGI

____CHOICES
____VIP
____COIN
____VIEW
____OTHER (specify)____________
____

Indicate with a √√ those that you have actually used.

Which system(s) do you prefer?____________________
For what reasons?____________________
____

COSTS

Is your organization likely to assume (or pass on) costs of a CIDS in one or more of the following categories:

____purchase of a terminal
____fee per student/client
____annual service contract
____fee based on total student/client population
____other (specify)

What charges would be reasonable for your organization to assume:

____$.50 - $1
____$1 - $5
____$5 - $20
} fee per student/client

____$1000 - $5000
____$5000 - $20000
} fee based on total enrollment

____$1000 - $5000
____$5000 - $20000
} fee per terminal, installation and maintenance

____$1000 - $5000
____$5000 - $20000
} yearly contract

PREFERENCES

Indicate your preferences for CIDS features by assigning 100 points between the following two items and further divide the allocated points among the sub-items listed.

____INFORMATION
  ____career
  ____school
  ____skills training
  ____occupations
  ____placement

Divide 100 points

See next page

____GUIDANCE
    ____decision making
    ____values clarification
    ____career choice
    ____school/training choice

Divide 100 points among the following CIDS models. Again, further divide the allocated points among the sub-items listed.

____COMPREHENSIVE: This model establishes a single, widely applicable system statewide. Here, the computer system could be located at a single, central site or at several regional sites. Adoption of a single statewide system would not preclude the use of other systems.

____DECENTRALIZED FOR SPECIAL POPULATIONS: This model facilitates and supports a multitude of systems that co-exist statewide. In this case, the model would serve certain target groups by coordinating those systems which best serve these clients' special needs or those groups or regions which share interests and/or needs.

____DECENTRALIZED FOR REFERRAL: This model facilitates and supports a multitude of systems that co-exist statewide. Here, the model would handle information requests by referring the client/agency to the proper source or system.

Divide 100 points among the following items to indicate your preference for CIDS availability:
____schools (each K-12 school)
____school districts (1 terminal per district)
____school districts (more than 1 terminal per district but not in each school)
____community colleges
____CETA intake offices
____community-based agencies
____libraries
____consortium of community-based organizations

Divide 100 points to indicate your preference regarding CIDS users:
____students-elementary/secondary
____students-college/university
____students-skills training programs
____CETA participants
____public aid recipients
____Veterans
____other (specify)____
____

How local should the information contained in CIDS files be? Indicate level of importance for each type of information. (1=first, 2=second, 3=third) Select those items of concern to you.

	COMMUNITY COLLEGES	4-YEAR COLLEGES	PROPRIETARY SCHOOLS	CAREER INFORMATION	SKILLS TRAINING INFORMATION	SCHOOL/COLLEGE CHOICE	JOB PLACEMENT	LABOR MARKET
Congressional district								
Zip code								
Community college district								
School district								
SMSA								
Region								
State								
National								

Who, inside or outside your agency, would be the key decision-maker concerning your agency's participation in a statewide CIDS?

____

____

____